Understanding the achievement of benefits through use of Enterprise Content Management (ECM) systems in Public Sector Organisations

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List of publications arising from this dissertation

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Salamntu, L.T.P., & Seymour, L. (2015). A review of Enterprise Content Management (ECM): Growth and Maturation of ECM from the year 2001 to 2011. *The Fifth International Conference on Digital Information Processing and Communications (ICDIPC2015), 07-09 October 2015, Sierre, Switzerland, 31-37.*

Abstract

Public sector organisations are implementing the Enterprise Content Management (ECM) system because of their large volume of unstructured content which led to documents being stored in various repositories. This made it difficult for such organisations to access, control and locate documents. ECM systems are therefore implemented to address the uncontrolled manner in which documents are saved, stored and accessed by employees. There were a number of other anticipated benefits. This study aims to explore and understand the achievement of benefits through the use of ECM systems and to determine the barriers preventing the benefits from being achieved in public sector organisations.

The study used a qualitative research approach. Two cases of the public sector organisations were investigated in a cross-sectional study. Data was collected through semi-structured interviews and by viewing organisational documentation. Data was analysed using thematic analysis with elements of deductive and inductive approaches. An ERP benefits framework and the Enhanced Impact framework formed a theoretical base and were used as a lens for collecting and analysing data.

It was found that the one out of the two sector organisations implemented the ECM system without the prior identification of benefits. Both public sector organisations implemented the system without involving the people who would be using the ECM system. An analysis of how ECM benefits were achieved revealed that a central storage point results in achieving ease of document retrieval. The analysis also showed that benefits influence each other, hence causal benefits emerged from the study. Similarly, barriers preventing the achievement of full benefits also influence each other and a barriers causal model was developed from the study.

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Abbreviations

BU Business Unit

C1 Case Study 1

C2 Case Study 2

CRM Customer Relationship Management

ECM Enterprise Content Management

EDMS Electronic Document Management System

ERP Enterprise Resource Planning

ES Enterprise System

ICT Information Communication Technology

IS Information Systems

ISO International Standards Organisation

IT Information Technology

KM Knowledge Management

KMS Knowledge Management System

Chapter 1: Introduction

An Enterprise Content Management (ECM) system is a technology which provides an organisation with a platform to house unstructured content in order to have information delivered in a proper format to multiple enterprise applications (Dirking and Huff, 2010). Initially ECM systems were implemented by private organisations, but public sector organisations have begun to appreciate the need to implement ECM systems. The implementation of ECM systems in public sector organisations is triggered by large volumes of unstructured content which results in documents being stored in various repositories, making it difficult to access, control and locate documents (Vidgen, Goodwin and Barnes, 2001). An ECM system was therefore seen to be an appropriate tool for addressing this issue. In this study, 'public sector organisation' refers to a nonprofit entity that is owned by the government and is mandated to deliver on specific public services.

The purpose of this study was to explore the benefits of using an ECM system and to identify the barriers to achieving the benefits in public sector organisations. The study sought to achieve this by investigating if the benefits found in literature would be the ones experienced in reality by individuals in these organisations. The understanding of the benefits could inform the decision makers of how to make viable options or investments that would help to deliver the actual benefits.

The study adopted a qualitative research method, while data was collected through semi-structured interviews and analysed using thematic analysis (Braun and Clarke, 2006). Both inductive and deductive approaches were considered for the analysis. In order to gain an in-depth understanding of the benefits that were achieved, the study focused on two case studies, both being public sector organisations. In South Africa, there is a concern about service delivery; in order to address this, the ECM system should be used. Data collection and analysis were guided by the benefits and barriers framework. This assisted the researcher to identify the benefits and barriers that emerged from the study.

1.1 Background and problem definition

An ECM system promises significant benefits to organisations that implement them. However, it is argued that organisations do not always achieve what they desire from the implemented enterprise systems (McDonald, 2009). It is further argued that identifying the benefits achieved through an implemented system is difficult. This is because some of the benefits emanate from the manner in which the system was implemented, as well as how the employees within the organisation use the system (Eckartz, Daneva, Wieringa and Hillegersberg, 2009). There are benefits that might not be achieved due to lack of top management commitment and other factors. One other factor could be the failure to manage organisational change during the implementation process (Davenport, Harris, De Long and Jacobson, 2001).

In investigating the benefits of using an ECM system, it became apparent that the benefits are often extolled by ERP vendors on their websites (Medina, 2014). Furthermore, there is no alignment between customers and vendors as far as ECM benefits are concerned (McKinnon, 2010). Although an ECM system provides significant benefits to organisations, there are some barriers which hinder the benefits from being achieved fully.

Some of the challenges that are faced by organisations before implementing an ECM system are:

- Data captured in public organisations is normally unstructured and not easily found when required (O' Callaghan and Smits, 2005).
- Documents are stored in various repositories making it difficult to access, control and locate (Vidgen et al., 2001).
- There are large volumes of documents that are managed manually (Chieu and Zeng, 2008).
- There is no restricted access to sensitive documents.
- The latest version of the document is not easily known.
- Documents are duplicated.

The Information Communication Technology (ICT) initiatives that the government invests in vary from business intelligence, e-governance, knowledge management and ECM, to name but a few. In this research, the focus was on the ECM system. ECM is one of the main

solutions that enables the identification and storage of documents in a more structured manner (Grahlmann, Hilhorst, van Amerongen, Helms and Brinkkemper, 2009). Over the past decades there has been a great deal of attention devoted to effectively securing documents and improving records management in public sector organisations. These public sector organisations have also realised the need to effectively retrieve the right information and to provide it to the relevant persons (Kwatsha, 2010). Hence, ECM was implemented to store these documents in a structured manner for ease of sharing and subsequent retrieval (Paivarinta and Munkvold, 2005).

There are many information systems projects that result in the project being technically completed, but with delivery of desired benefits lacking (Peppard, Ward and Daniel, 2007). To spend money and not achieve the benefits after the implementation is a problem which needs to be investigated and understood. There was a lack of understanding as to why these benefits were not being achieved. This study identifies the benefits of using ECM as well as barriers hindering the expected benefits from being achieved in public sector organisations. Furthermore, this study invested the ECM benefits and barriers in the context of public sector organisations in South Africa.

1.2 Research purpose

The purpose of this study is to understand the achievement of benefits through ECM use in public sector organisations. The study will also explore the various factors preventing the expected benefits of ECM from accruing in public sector organisations. To achieve this, the following section will highlight the research objectives and research questions that will assist in addressing the problem.

1.3 Research objectives

This study is exploratory in nature and follows an interpretive perspective in order to understand the achievement of benefits through the use of ECM in public sector organisations.

The main objective of this study was to understand the benefits of using ECM in public sector organisations. The intention was to gain an in-depth understanding of the benefits achieved and the barriers to achieving these benefits. The objectives may be broken down as follows:

Main objective:

- To understand the benefits achieved through the use of an ECM system as well as to understand what prevents the benefits from being achieved.

Secondary objectives:

- To understand what benefits are actually achieved through the use of an ECM system;
- To understand how the benefits are achieved through the use of ECM in public sector organisations; and
- To understand why the advertised benefits of using ECM are not fully achieved in public sector organisations.

These were looked at from the public sector organisation's perspective, as they seem to be the ones who do not achieve the benefits of the implemented ECM systems.

1.4 Research questions

Based on the research objectives formulated in the previous section, the research questions were as follows:

Main research question:

- What are the benefits of using ECM systems in public sector organisations and what are the barriers to achieving these ECM benefits?

Secondary research questions:

- What are the benefits of using ECM in public sector organisations?
- How are the benefits achieved?
- What are the barriers to achieving ECM benefits?

1.5 Importance of the research

The practical contribution of this study is the fact that public sector organisations can use the framework developed for identifying ECM benefits, particularly in public sector organisations. Without doubt this study will provide researchers and practitioners alike some

perspective with regard to the benefits of ECM systems, as well as the barriers preventing such benefits from being achieved.

There have been several studies on ECM focusing on its development and deployment, but there have been limited studies which focus on the achievements of benefits and barriers which prevent benefits from being achieved. Even the research on ECM has been limited (Tyrvainen et al., 2006). Most research focuses on analysing the impact of ECM on organisational performance based on efficiency or content availability (vom Brocke, Seidel and Simons, 2010).

The theoretical contribution of this study is discussed through the theory of understanding (Gregor, 2006). This study explores the benefits of using an ECM system in public sector organisations. However, the analysis of this study resulted in the formation of an ECM system benefits and barriers framework. The benefits framework contributes to understanding what benefits are actually achieved and how the benefits are achieved through the use of ECM systems. However, the barriers framework contributes to identifying what the barriers to achieving the ECM benefits are. From the analysis, the findings show new benefits and barriers which were not in the previous ECM literature.

1.6 Approach to theory

The study was carried out in two public sector organisations and the study confirmed that deductive and inductive approaches could be used for determining ECM benefits. As a guiding lens, a theoretical framework was adopted to explore the benefits and to identify the barriers preventing such benefits from being achieved.

1.7 Structure of this dissertation

This dissertation consists of five chapters and is arranged as explained below.

Chapter 1 covers the introduction to the study and this is where the importance of the research, the research objectives and the research questions are formulated.

Chapter 2 provides a literature on ECM and a theoretical model will be derived.

Chapter 3 describes the research methodology: philosophical assumptions, research approach, methods and analysis. The limitations of the study are also outlined in this chapter.

Chapter 4 presents the research findings and highlights the contribution of the researcher towards a theory.

Chapter 5 concludes the dissertation by presenting a summary of findings as well as stating the contribution of the study to practice; it provides future research recommendations. It also suggests future research work related to this study. Limitations of the study are revisited as well.

Chapter 2: Literature Review

The purpose of this chapter is to present a theoretical framework of ECM's benefits and also barriers to the achievement of expected benefits, based in the review of current literature. The rest of this chapter is organised as set out below. Section 2.1 provides definitions of an ECM system. Section 2.2 identifies and explains other technologies used by organisations. Section 2.3 gives an overview of the four ECM dimensions. Section 2.4 provides an overview of the public sector organisations, Section 2.5 provides an explanation on ECM in public sector organisation. Section 2.6 provides an explanation of benefit's realisation. Section 2.7 provides potential benefit's frameworks. Section 2.8 discusses adopted conceptual framework. Section 2.9 identifies the potential benefits of ECM. Section 2.10 discusses the achievement of benefits. Section 2.11 discusses the various theoretical frameworks. Section 2.12 identifies the barriers preventing the full benefits from being achieved. Section 2.13 concludes the chapter.

2.1 ECM system definition

ECM is an evolving concept that has been applied in many industry sectors (Cleven, Simons and vom Brocke, 2011). With that evolution, there have been many different definitions by many authors (Grahlmann, Helms, and Hilhorst, 2011). One author defined it as a technology which provides an organisation with a platform to house unstructured content in order to have information delivered in a proper format to multiple enterprise applications (Dirking and Huff, 2010). ECM is also defined as a web-based publishing system that manages a large number of electronic documents (Iverson and Burkart, 2007).

An ECM system is an approach to assist organisations to reduce search times (Brocke, Simons, Herbst, Derungs and Novotny, 2011). Having noted the wide range of definitions for ECM, it is necessary to adopt a particular definition for the purposes of this study as follows. ECM is an integrated system that locates content in a structured manner for ease of use, search and reference. Content refers to any type of document presented in any format that requires to be saved in electronic format (Breitner, Hohler, Neumann and Rickenberg, 2012).

It is well understood that, due to the high volume of documents in public sector organisations, searching for documents usually takes a long time. Therefore, a properly utilised ECM

system is perceived to reduce the search times, as well as to ensure that documents are retrieved with ease (Brocke et al., 2011). Having seen what ECM systems can do, public sector organisations began to implement such systems and money was expended in the implementation process. Even though organisations continue to spend money on systems, the benefits desired from the investments are not always achieved (Schubert and Williams, 2010).

The next section identifies and explains other technologies used by organisations.

2.2 Definitions of other technologies used in organisations

The purpose of this section is to illustrate other available technologies used by organisations and to provide a rationale why an ECM system was chosen. There are three other different systems identified in this study that are used by organisations for effective communication, records management, document storage and retrieval, and for managing organisational knowledge. These systems will be briefly described and compared to the ECM system. These systems are called Enterprise Systems (ES), Enterprise Resource Planning (ERP) systems and Knowledge Management (KM) systems and are now discussed in detail.

2.2.1 Enterprise System (ES)

ESs are tools used for integrating and extending business processes and which provide a single central system ensuring that information is shared across all functional areas (Davenport, Harris and Cantrell, 2004) Research findings continue to state that organisations do not achieve what they desire from the implemented ESs (Grant, Hall, Wailes and Wright, 2006; McDonald, 2009). ES enables information to flow within and between processes in many organisations. For a system to be an ES, it needs to be integrated, to adhere to best practices, must have packages and must be evolving (Pearlson and Saunders, 2009). An enterprise system software package includes Enterprise Resource Planning (ERP) software and other related packages such as customer relationship management (CRM), which will not be discussed in this study. Therefore, ES does have some similarities with ECM systems in that both systems are essentially information systems which connect and manage information flows across business functions.

2.2.2 Enterprise Resource Planning (ERP) system

An Enterprise Resource Planning (ERP) system is defined as a packaged software application that connects and manages information flows within and across a complex organisation, allowing managers to make a decision (Davenport et al., 2004). The purpose of an ERP is to achieve efficiency, competency and competitiveness (Xu, 2011). As a result ERPs are considered to be essential information systems infrastructure for organisations.

When comparing an ECM system to an ERP system, it was found that the ERP systems are not easily able to exchange workflow information; this resulted in a lot of unstructured information being re-typed manually, leading to errors, inaccuracies and duplications (Weill, Subramani and Broadbent, 2002). However, ERPs do have some similarities with ECM systems in that both systems are essentially information systems which connect and manage information flows, as well as cross-cutting across business functions.

2.2.3 Knowledge Management System (KMS)

A Knowledge Management System (KMS) refers to all processes necessary to generate, capture, codify and transfer knowledge across the organisation in order to achieve competitive advantage. Since KMS is regarded as a process involving various activities, KMS is composed of a bundle of KMS-related tools that support and enhance knowledge processes (Kou and Lee, 2011). A KMS focuses on improving innovation and flexibility by encouraging knowledge sharing (Newell, Huang, Galliers, and Pan, 2003). A KMS puts more emphasis on how organisations can enhance competitive advantage through more effective utilisation of knowledge assets. It is through improved knowledge sharing and knowledge creation that flexibility and innovation is enhanced (von Krogh, Ichijo and Nonaka, 2000). However, an ECM system is different from a KMS in that an ECM is a platform for housing unstructured content in order to have information delivered in a proper format to multiple enterprise applications (Dirking and Huff, 2010), whilst KMS plays a role in managing organisational knowledge (Kou and Lee, 2011).

2.3 The four ECM dimensions

An ECM operates in an integrated manner, having four dimensions which address the four perspectives. These dimensions are content, process, technology and enterprise (Tyrvainen et al., 2006). This section demonstrates what each dimension entails. This study will briefly

mention these dimensions but not comment in depth. For the ECM system to be successful, the four dimensions need to be considered (Tyrvainen et al., 2006).

In explaining these dimensions, **content** is mentioned as focusing primarily on information, users and systems, whereas **processes** focuses on development and deployment. **Technology** is an important enabler of ECM as it addresses the hardware, software and standards that support the management of content, whilst **enterprise** acts as an overview perspective which describes the economic context of the ECM system (Tyrvainen et al., 2006).

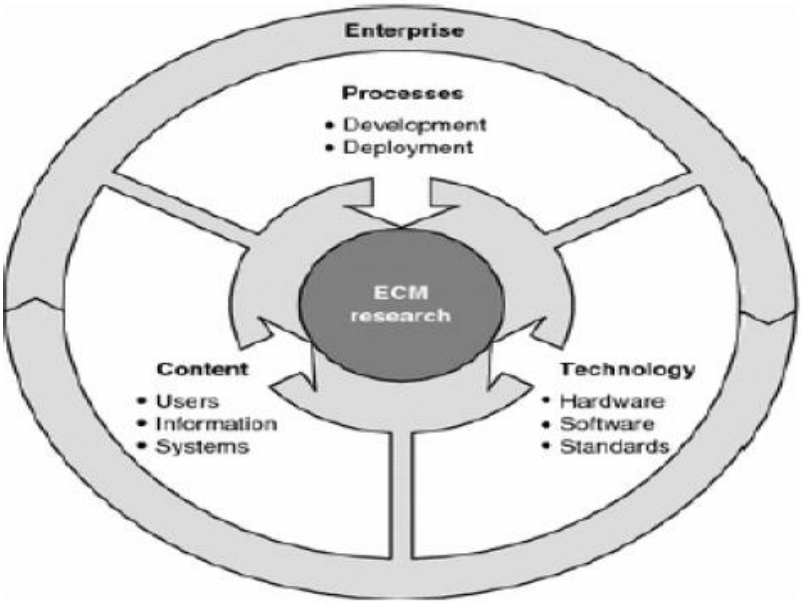

Figure 1: The four ECM dimensions (Tyrvainen et al., 2006)

It is also confirmed that ECM is integrated and has to fully consider all the dimensions mentioned above (Cleven et al., 2011). However, the lifecycle of ECM includes activities such as capturing, storing, creating, reviewing, editing, distributing, publishing, archiving and deleting content (Paivarinta and Munkvold, 2005). This framework was later extended to include drivers/benefits of ECM (Usman, Muzaffar and Rauf, 2009), as shown in Figure 2.

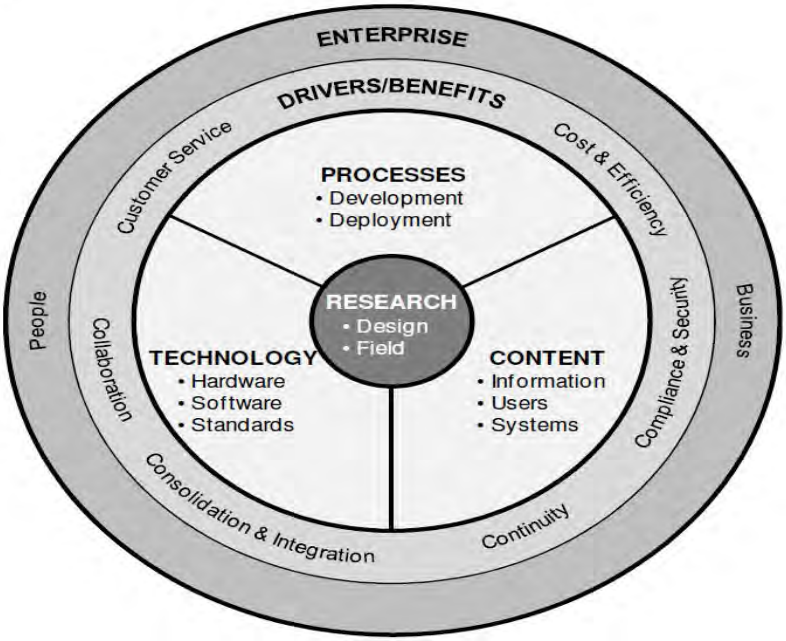

Figure 2: Extended four ECM dimensions (Usman et al., 2009)

The four ECM dimensions were extended to include the drivers/benefits. The drivers/benefits of ECM identified were cost and efficiency, compliance and security, continuity, consolidation and integration, collaboration and customer service (Usman et al., 2009). A detailed explanation of ECM benefits will be discussed in section 2.9 of this dissertation. In section 2.8, other benefits identified in the literature will also be discussed.

2.4 Overview on public sector organisations

The public sector organisations operate in a political environment and are controlled and funded by the government. These organisations normally compete for funding and power amongst other public sector organisations (Jarrar and Schiuma, 2007). However, funding is allocated according to political decisions. Government has doubtless come a long way in appreciating the value of technology and, as a result, government is making significant investments in Information and Communication Technology (ICT) initiatives and infrastructure (Kaisara and Pather, 2011). The public sector organisations have also began to request funding from the government to take advantage of the benefits associated with such ICT initiatives.

However, government investments in ICT have been directed towards enhancing efficiency and policy effectiveness and in achieving broader democratic values (Gronlund and Horan, 2004). The public sector organisations have a mandate to report on any fund awarded, hence it is important to understand the achievement of benefits from any implemented systems.

2.5 The need for further ECM research

With public sector organisations, there is limited research pertaining to the achievement of benefits through the use of an ECM system. There is also a paucity of studies relating to the implementation of electronic documents and records management in public sector organisations (Katuu, 2012). Moreover, two authors state that there is a gap in the field of ECM and further research is required for improving records management in organisations (Alalwan and Weistroffer, 2012).

Public sector organisations operate under tight budgets; this puts further constraints on service delivery (Pretorius and & Schurink, 2007). It is for this reason that public sector organisations were chosen for this study. It is believed that the benefits of ECM still require attention in these environments. The following section will explain the term 'benefits realisation'.

2.6 Explanation of benefits realisation

Before explaining the term 'benefits realisation', it is necessary to first clarify the two words that make up this term separately. The benefits can only take effect after the system has been implemented. Benefits in the IT investment context are regarded as an outcome that is advantageous to an organisation in terms of nature and value (Bennington and Baccarini, 2004). On the other hand, benefits could also be defined as being afforded to individuals or groups of people due to achieving the required objectives (Ward, Daniel, and Peppard, 2008). For the purposes of this study, the benefits referred to will be the one defined in the context of IT investment. However, there are a number of benefits frameworks which will be explained later in this study.

Previous studies make it clear that organisations have challenges in measuring the benefits and as a result there is often no established metrics in place. However, the ability for one to

measure benefits is often reported as one of the most important issues for senior IT management (Silvius, 2008). It is for this reason that organisations do not have benefit measures in place after the system has been implemented. It was noted that benefits realisation takes place years after the system has been implemented (Weider, Booth, Matolcsy and Ossimitz, 2006). Also, the fundamental concept of benefits realisation assists organisations to deal effectively with issues of measuring the values by identifying the outcomes to measure and how to measure them, as well as how to make the measurement come alive (Thorp, 1998).

The realisation of benefits arising from the implementation of enterprise systems is a significant challenge in both research and practice, even though there have been many studies pertaining to benefits realisation. It was suggested that, in order for the benefits to be achieved, organisations are required to do new things or do things differently (Ward et al., 2008). It is stated that the project team members only identify benefits when writing the business case and the benefits are mostly over-estimated (Ashurst, Doherty and Peppard, 2008). Therefore, the process of benefits realisation in organisations is not well understood. However, this research will not study this phenomenon but will study the achievement of benefits through the use of ECM in public sector organisations.

2.7 Potential benefits frameworks considered for this study

Since the ECM benefits framework has limited research information available, this study uses some of the potential benefits framework of ERPs in attempting to categorise the ECM benefits. This section will explain the potential benefits frameworks. Then, after the potential ECM benefits are identified, the understanding of the achievements of ECM benefits is explained in the next section.

2.7.1 Benefits classification framework

There are different views on the nature of the benefits that can be derived from systems. There are so many benefits frameworks that have been studied and developed throughout the years. For one to have a complete understanding of Information Systems (IS) benefits in any given context, there needs to be an evaluation of multiple tools addressing the phenomenon (Mirani and Lederer, 1998). In addition, a framework must be used as an underlying theoretical basis. Following on from this observation, the study will evaluate a number of

frameworks and identify the one that will best fit the objectives of the study. The five different benefits framework are discussed below.

2.7.2 ES Benefit Framework (Shang and Seddon, 2002)

The Shang and Seddon (2002) benefit framework revolved around trinity levels of management such as operational, managerial and strategic levels (Anthony, 1965). These levels were used as a foundation of their model and it was after an extensive lecture study that the trinity levels of management were extended. Shang and Seddon (2002) proposed two additional dimensions which are IT Infrastructure and Organisation on framework developed from (Anthony, 1965). The five dimensions are discussed below.

- **Operational Benefit**: is defined as the day-to-day activities that involve acquiring and consuming resources. These activities are normally repeated periodically, for example daily, weekly or monthly (Shang and Seddon, 2002). As can be seen in Table 1, operational benefits might help the organisation to reduce costs and cycle time, and improve productivity, quality and customer service.

- **Managerial Benefit**: is defined as business management activities involved in the allocation and controlling of the firm's resources, monitoring of operations and supporting of strategic business decisions (Shang and Seddon, 2002). The sub-dimension in managerial benefit is to have better resource management, improve decision making and performance improvement.

- **Strategic Benefit**: Shang and Seddon (2002) define this dimension as involving long-range planning pertaining to high level decisions entailing customer retention, product planning, business emerging and acquisition.

- **Information Technology (IT) Infrastructure Benefit**: is defined as one that consists of shareable and reusable IT resources that provide the foundation for current and future business applications (Shang and Seddon, 2002).

- **Organisational Benefit**: occurs when the ES benefits an organisation in terms of empowerment, learning, building a common vision and in changing work patterns (Shang and Seddon, 2002).

Table 1: ES benefits framework (Shang and Seddon, 2002)

DIMENSIONS	SUBDIMENSIONS
Operational	1.1 Cost reduction 1.2 Cycle time reduction 1.3 Productivity improvement 1.4 Quality improvement 1.5 Customer service improvement
Managerial	2.1 Better resource management 2.2 Improved decision making and planning 2.3 Performance improvement
Strategic	3.1 Support for business growth 3.2 Support for business alliance 3.3 Building business innovation 3.4 Building cost leadership 3.5 Generating product differentiation 3.6 Building external linkages
IT Infrastructure	4.1 Building business flexibility for current 4.2 IT cost reduction 4.3 Increased IT infrastructure capability
Organisational	5.1 Changing work patterns 5.2 Facilitating organisational learning 5.3 Empowerment 5.4 Building common vision

This framework does have its own shortcomings in that not all the benefits defined in the categories can be achieved in organisations, neither is it possible to only achieve the listed ones. This framework is for ESs and not all the benefits classified would be relevant to ECM systems. Therefore, this framework cannot be the sole one used for the purposes of this study. Schubert and Williams (2011) argue that the existing frameworks and classifications of ES benefits are limited to two levels, for example a category heading and its elements. Therefore, it is important to note that using the Shang and Seddon (2002) framework alone will introduce limitations.

2.7.3 Effects of ICT in organisations framework (Bouwman et al., 2005)

A different framework for classification of benefits was developed; this was on how the benefits of an implemented system should be categorised. In a proposed framework, benefits are split into three categories, namely, individual, organisational and environmental, where the organisation and the environment are further broken down into sub-categories referred to in the following Figure 3 (Bouwman et al., 2005). Individuals are the first category, ranging from enhanced individual productivity to increased employee satisfaction.

Organisation is the second main category which is split further into processes and structures. The processes look at, for example, efficiency, improved quality of management and content sharing. The next sub-category within the organisational category is the structures. In attempting to explain the structure sub-category, a model is used for providing an in-depth understanding (Fulk and DeSanctis, 1999). The model stipulates that the structural sub-category is split further into horizontal co-ordination, vertical control, types of connection and size, scope and product domain. Among the benefits of horizontal coordination is, for example, a reduction in transaction costs of cross-functional or virtual teams. The vertical control looks at the controlling of employees by superiors, whilst the types of connection look at the relations that exist within and between organisations.

The final main category in this model is the environment which consists of sub-categories, namely, inter-organisational relations and context. The latter is concerned with competitors, suppliers and customers and describes the general economic movement towards an information economy.

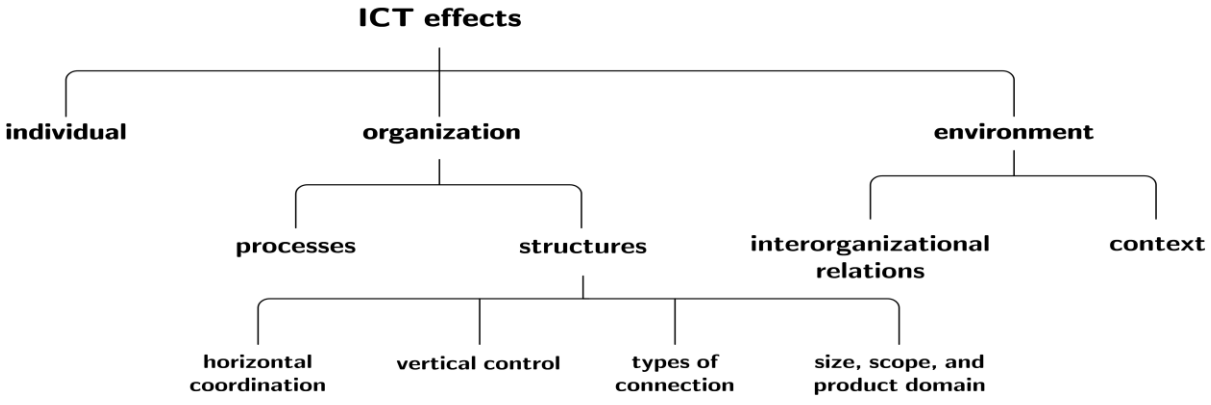

Figure 3: Effects of ICT in organisations (Bouwman et al., 2005)

This framework shown in Figure 3 also has its own shortcomings because, in this framework, there is no classification of benefits as compared to the Shang and Seddon (2002) framework. Finally, this framework focuses on individual impact rather than a group of individuals such as employees in the organisation. It is for these reasons that this framework should be complemented by others to fulfill the purposes of this study.

2.7.4 Enhanced benefit framework.

The Enhanced benefit framework by Grahlmann et al. (2009) combined ES benefits classification (Shang and Seddon, 2002) and Effects of ICT in organisations (Bouwman et al., 2005) with minor changes incorporated, as shown in the following Figure 4. This enhanced framework was designed to address the shortcomings identified in all three frameworks on which it was attempting to improve.

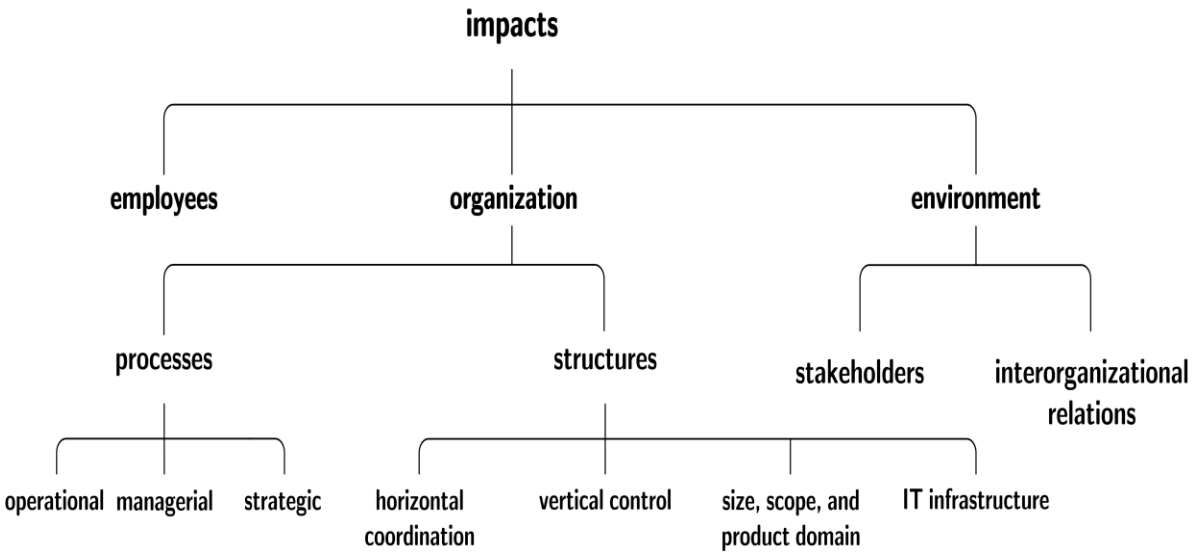

Figure 4: Enhanced impact framework (Grahlmann et al., 2009)

This framework has attempted to improve on the previous models that had been developed. Also, it has detailed insights on the nature of the impacts, as it has dimensions that appear to be critical as a basis for identifying the benefits in all aspects of the organisation. This framework will be used in conjunction with the ES benefits framework (Shang and Seddon, 2002) and will be validated in an ECM environment as previous studies have used it in ERP environments.

2.7.5 The Johnston and Bowen framework

The Johnston and Bowen (2005) benefit framework looked at three dimensions of measurable benefits which were: (i) individual users, (ii) organisation and (iii) society as a whole. The individual users, when using the electronic document management system (EDMS), experienced the readiness of available information, creator quality, efficiency and effectiveness at work. The processes are mentioned to be better, easier and quicker. The benefits achieved by the organisation are that work is executed more quickly; there is improved cash flow; and compliance with laws and regulations is achieved and demonstrated. For society, the quality of life is improved and the historical record is accessible and reliable. This framework also does have its own shortcomings in that the benefits classification is limited to three dimensions, whilst the Shang and Seddon framework has at least five dimensions. Therefore the Johnston and Bowen (2005) framework was not used.

2.8 Discussions on adopted conceptual framework

The benefits of using the ECM system is always identified by the service providers, as previously mentioned, and public sector organisations do not always achieve these benefits. Organisations in all types of industry develop information systems to achieve benefits (Schubert and Williams, 2011). The study conducted by Dirking and Huff in 2010 indicated that there are several ways in which organisations benefit from ECM technology. It was from this that the benefits conceptual framework was formulated in order to put a structure to this study. According to Alalwan and Weistroffer (2012), a literature review assists researchers in developing a theoretical framework that can assist to structure future studies. This section of the paper categorises the benefits of ECM as well as the factors preventing the achievement of benefits from being achieved.

2.8.1 Conceptual framework

The framework in the following Table 2, which is the author's own model, shows a combination of two frameworks which is the ES benefits framework (Shang and Seddon, 2002) and the Enhanced impact framework (Grahlmann et al., 2009). Table 2 shows a classification of ERP benefits that could be relevant to ECM and it is hoped that the framework could be validated in future studies of ECM, particularly in the public sector

organisations. This conceptualised framework is the best fit for this study, instead of other frameworks, because it will attempt to identify, categorise and explain the benefits.

The ES Benefit Framework could not be the sole one used as there were other benefits that could arise in an ECM environment. However, all the defined benefits were taken into consideration. The enhanced impact framework was a model used in an ERP environment and was used as an aid to improve models that had been previously developed. The dimensions eliminated in this framework were processes and structures.

Table 2: Researcher's own model of benefits classification

BENEFITS FRAMEWORK	
DIMENSIONS	**SUBDIMENSIONS**
1. Operational	1.1 Cost Reduction 1.2 Cycle time reduction 1.3 Productivity improvement 1.4 Quality improvement 1.5 Customer service improvement
2. Managerial	2.1 Better resource management 2.2 Improved decision making and planning 2.3 Performance improvement
3. Strategic	3.1 Support for business growth 3.2 Support for business alliance 3.3 Building business innovations 3.4 Building cost leadership 3.5 Generating product differentiation 3.6 Building external linkages
4. IT Infrastructure	4.1 Building business flexibility 4.2 IT cost reduction 4.3 Increased IT infrastructure capability
5. Organisational	5.1 Changing work patterns 5.2 Facilitating organisational learning 5.3 Empowerment 5.4 Building common vision 5.5 Horizontal co-ordination 5.6 Vertical control 5.7 Size, scope and product domain
6. Employees	6.1 User friendliness
7. Environment	7.1 Stakeholders 7.2 Inter-organisational relations

2.9 Potential benefits of ECM

There are a number of ways in which organisations can benefit through the use of ECM, yet these are not always achieved in organisations. Schubert and Williams (2011) clearly stated that organisations in all industries develop systems to achieve benefits out of that particular system. This statement is supported by the theoretical framework which stipulated that an implementation of a system is driven by a motive or rationale (Daniel and Godspower, 2011). Therefore, it is important to identify the potential benefits that can be derived by the use of ECM.

This section will explain the possible benefits that organisations can achieve, as identified in the literature, by using an ECM system.

2.9.1 Compliance

Compliance was identified as a potential benefit. This includes adapting to good records management as well as keeping good records which protect the enterprise from harmful damage (Sprehe, 2005). Records management systems facilitate compliance by demonstrating that legal requirements are met (International Council on Archives, 2008). A study by two authors also identified compliance to be amongst the benefits of ECM (Alalwan and Weistroffer, 2012; Kunstova, 2010).

2.9.2 Collaboration

ECM allows documents to be shared with ease across functional units as well as within an organisation (Paivarinta and Munkvold, 2005). Furthermore, collaboration in ECM includes a significant amount of engagement between employees in terms of content and knowledge sharing. It is mentioned that collaboration allows individuals with different types and levels of expertise an opportunity to create better outcomes faster (Duhon, 2005).

2.9.3 Reduction of costs

Having an automated system will produce outputs that are effective and which could also result in reduction of costs (Clark, 2008). The implementation of ECM results in cost savings in information processing, operations and facilities (Paivarinta and Munkvold, 2005). Having a fully functional ECM system results in a cost saving to the information management of essential business functions (Sprehe, 2005).

2.9.4 Improved efficiency

With the implementation of an ECM system, organisations are able to improve on how tasks are performed. Paivarinta and Munkvold (2005) mention that content is able to be reused effectively and efficiently. Therefore, ECM does improve the efficiency with which tasks are performed (Tyrvainen et al., 2006).

2.9.5 Controlled access to content

The controlled access to content looks at who has access to what file or document within an organisation. With implementation of an ECM system, content is shared by the right people at the right time and one sees only relevant information (Dirking and Huff, 2010). Other benefits of recordkeeping are having an improved security of business records and having robust management of confidential information (International Council on Archives, 2008).

2.9.6 Improved consolidation and integration through business processes

Improved business process efficiency is one of the benefits of using ECM (Ebrahim and Shawi, 2004). Implementation of ECM leads to the simplification of forms and work processes (McKeen and Smith, 2003). The next section highlights the reasons why organisations do not achieve the expected benefits from implemented systems.

2.10 Understanding the achievement of benefits

There are a number of reasons why organisations do not achieve the expected benefits from an implemented system. These reasons are highlighted by (Pervan and Lin, 2003) as follows:

- Organisations have limited ability to manage change.
- The necessary means for benefits realisation are not identified.
- There is an inability to identify the benefits upfront.

It is argued that this initial vagueness results in benefits not being achieved in organisations (Reiss, 2006). The issue of organisational culture is of importance in any implementation of information systems and, if not attended to, could result in resistance by the users. One author supported this argument by stating that when IT conflicts with an organisational culture, the implemented information system will be rejected or there will be a high resistance in using it (Cooper, 1994).

Various studies have been conducted using theoretical frameworks to explain the benefits of ERP. Commonly used theoretical frameworks include the Effects of ICT in organisations by Bouwman et al., (2005), the Enhanced impact framework by Grahlmann et al., (2009), the ES benefits framework (Shang and Seddon, 2002). All these theoretical frameworks are explained in-depth in the next section.

It should be made clear that some of the studies did not focus solely on ECM but on ERP systems. This study has borrowed the ERP frameworks and it will be confirmed if they are valid in the ECM environment.

Daniel and Godspower (2011) focused solely on ECM and incorporated the aforementioned theoretical frameworks. In their framework, the relationships between the benefits that the organisations achieve from using the ECM system and other concepts are incorporated as shown in Figure 5. According to Daniel and Godspower (2011), for the implementation of a system, an organisation must have a motive or rationale for wanting to implement such a system. They further allude to the fact that there are risks or obstacles in the process of implementing ECM systems and this is shown in Stage 1 of Figure 5.

In further explaining Figure 5, Stage 2 shows ECM architecture which consists of Document Management, Web Content Management and Records Management, to name but a few. Stage 3 shows the ECM system benefits which are linked to the benefit frameworks conceptualised in Stage 4. Therefore, Figure 6 is a conceptual framework that summarises the various concepts on ECM benefits and benefits frameworks from various literatures. This framework does not seem like a useful framework as there is no classification of benefits. Also, it does not address the reasons why benefits are not achieved. In addition, this framework does not indicate the factors preventing benefits from being achieved. Looking at the ways of theorising this framework, it should be noted that it does not fit a contextual-bound theory, as it does not offer an understanding of the relationship between the phenomena, as stated by (Llewellyn, 2003). This framework appears to be an example of a process theory, as it has different stages to it, because process theories determine outcomes over time. According to (Ko, Kirsch and King, 2005), process theories are appropriate for explaining how outcomes vary over time.

This framework is a good framework for explaining the processes from which the benefits are derived but it is not a classification framework that can be used for this study. This study was unable to find a theory to support the barriers to achieving benefits from ECM.

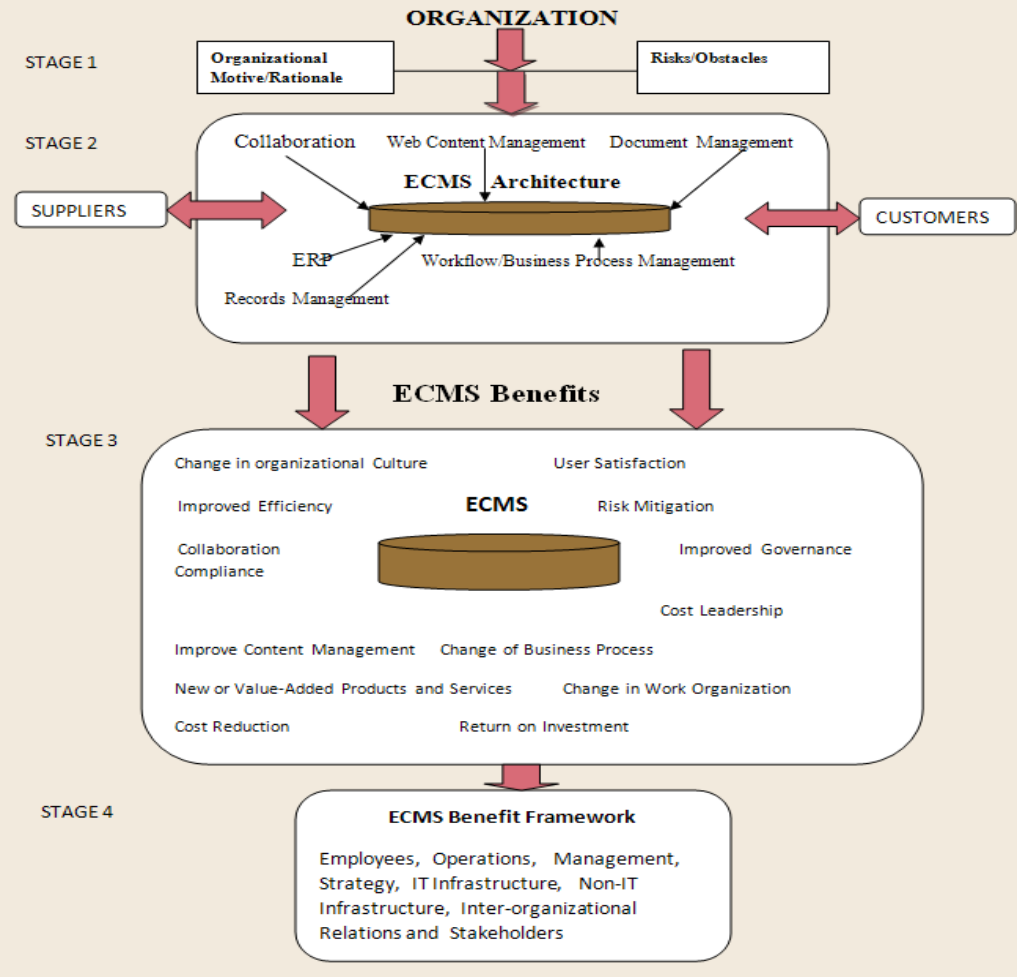

Figure 5: Conceptual Framework (Daniel and Godspower, 2011)

2.11 Barriers

From viewing ERP, ES and KMS literature on benefits, it became apparent that not all the identified benefits are achieved in organisations, as there are factors preventing such benefits from being achieved. This section identifies all the factors that hinder the ECM benefits from being achieved.

2.11.1 Lack of establishment of metrics

There is a failure by organisations to establish metrics beforehand. It has been mentioned that, without established metrics, organisations will not be in any position to know if the benefits have been achieved or not (Davenport et al., 2004; Markus and Tanis, 2000).

2.11.2 Lack of resources

Lack of resources means not having resources to support the organisation at the post-implementation stage. Having ongoing support at the post-implementation stage is necessary as it enables further in-house knowledge (Wagner and Newell, 2007).

2.11.3 Inappropriate IT Infrastructure

Inappropriate IT infrastructure was identified as another barrier in achieving the expected benefits (Ebrahim and Shawi, 2004). In the study pertaining to e-governance in South Africa, one of the findings was the fact that South African organisations do not necessarily have strong IT infrastructure, hence there tends to be a failure in IT projects (Mutula and Mostert, 2010).

2.11.4 Lack of top management support

In ECM systems implementation, top management support is regarded as a challenge. Top management support is a noteworthy challenge of ECM implementation (Wiltzius, Simons, Seidel and vom Brocke, 2014). Lack of top management support is not only an ECM challenge – ERPs also suffer from it. Previous studies indicated that top management support is needed during an ERP implementation (Somers and Nelson, 2000).

2.11.5 Lack of proper communication

From the study conducted by (Wiltzius et al., 2014)), one of the respondents mentioned that it is critical to clearly define and to communicate the objectives of ECM or no one will want to accept the system.

2.11.6 Organisational culture

Organisational culture is defined as a set of commonly held values, beliefs and assumptions within the organisation (Schein, 1990). The literature suggests that the fit between organisational culture and information system is important for organisations to reap potential

benefits promised by the system. When IT conflicts with an organisational culture, the implementation of the system will either be rejected, or modified, so that it meets the same culture (Cooper, 1994).

2.12 Research gaps

The subject of ERP benefits and classification frameworks has been discussed in the literature (Shang and Seddon, 2002). Despite having extensive research on ERP benefits, organisations still struggle to realise the expected benefits (McDonald, 2009). From the literature review, the benefits were explained in a broader context including other technology such as ERP technology. To some degree, the benefits were even outside the public sector organisations' domain. What was evidenced is the fact that there is no clear indication as to which benefits are valid for ECM in public sector organisations. Thus, these benefits need to be confirmed and verified in an ECM environment in the public sector domain. This study will attempt to undertake such confirmation and verification of ECM benefits within public sector organisations.

There seems to be a lack of understanding as to why these benefits are not achieved. The previous studies have shown the potential benefits, but very little has been made of the benefits and barriers preventing these benefits from being achieved.

2.13 Summary of Chapter 2

This literature review is aimed at understanding the achievement of benefits through the use of ECM in public sector organisations. Goldfinch (2007) argues that organisations have a huge amount of unstructured content and there is a significant amount of money invested in ECM systems. With the ECM system, organisations started to appreciate the tool, as the benefits were highlighted by the system's vendors.

However, the expected benefits of systems were not achieved in public sector organisations (Reiss, 2006); limited studies have been conducted in identifying the ECM benefits achieved in public sector organisations, as well as understanding why the ECM benefits are not achieved. Similarly, there were studies that investigated the understanding of benefits but they were from an ERP domain and not ECM. Therefore, the theoretical model for

understanding the benefits was found after surveying relevant benefits frameworks within the ERP domain. This framework needs to be confirmed in the ECM environment.

This model will be validated as a case study in public sector organisations that are currently using ECM; potentially, other researchers may also validate it in future studies. As previously mentioned, public sector organisations spend a lot of money on ECM systems yet the benefits do not always accrue. This was indicated to be a concern as so much money is invested in the implementation of systems in public sector organisations (Goldfinch, 2007). Therefore, a case study to fully have an understanding of the underlying factors is recommended.

Chapter 3: Research methodology

The research methodology provides an explanation as to how and when the research is carried out and it gives reasons why a particular method was chosen (Jabar, 2009). The theoretical contribution of this research will be discussed in light of Gregor's (2006) theory of understanding which will be elaborated more in section 5.2. This chapter describes the methodology followed for this research study. The underlying philosophy, research purpose, research approach, research timeframe, research strategy, approach to theory, data collection and analysis, ethical considerations and research limitations are described and summarised.

3.1 Underlying philosophy

In the world of research, for one to be in a position to conduct meaningful research on any topic, it is necessary to examine the fundamental assumptions regarding the nature of the world in which one lives and how it is perceived. In this way, a coherent research design can be proposed (Kanellis and Papadopoulos, 2009). In Information Systems (IS), epistemologies can be divided into three categories: positivist, critical and interpretive research (Myers, 2013). A detailed explanation of these different epistemologies is beyond the scope of this document but a brief description will suffice to contextualise the differences.

Positivist research is based on the premise of a realistic ontology and aims to produce measurable results in terms of numbers. Critics of positivist research state that this type of epistemology is superficial, it fails to deal with how people think and feel and that statistical samples often do not represent a specific group (Cavana, Delahaye and Sekaran, 2001). Positivist research will not be suitable for this study because it assumes that reality exists independently of it being constructed. In order for the achievement of benefits to be fully understood, there needs to be some knowledge obtained from the participants; this positivist research does not allow. Also, the researcher does not hold a positivist view of the world, nor is she trying to make generalisations from a sample population. In this study, positivism is rejected as it restricts the subject matter of inquiry; this restriction forces the researcher to avoid the world of consciousness and humanly created meanings, rather seeing the subject matter of inquiry as determined by objective social structures. The world of consciousness

and humanly created meanings is critical to this study's attempt to uncover ECM system benefits and barriers which prevent benefits from being achieved.

Critical research recognises that access to the world is, in fact, limited and always mediated by perceptual and theoretical lenses (Mingers, Mutch and Willcocks, 2013). This is not, however, the case in an interpretive approach, as it is believed that the phenomenon is understood through accessing meanings that participants assign to them. Critical research has been criticised in that it forces change on people, often when people are not ready for these changes to take place. Similarly, it is focused on destroying current reality without proving processes for building a new reality (Cavana et al., 2001).

An interpretive approach assumes that the facts ascribe certain meanings (Myers, 2013). This is further elaborated by stating that interpretive research attempts to understand phenomena through accessing meanings that participants assign to them (Orlikowski and Baroudi, 1991) and focuses on their cultural and historical context. Thus an interpretive researcher aims to study a phenomenon through trying to understand what the people assign to the situation. The interpretive research is built on seven principles (Klein & Myers, 1999). The first principle is called the principle of hermeneutic circle. It suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. In this study, the researcher's understanding based on the benefits literature of the ECM phenomena in public sector organisations constituted the part, whilst the whole consists of the shared meanings that emerge from the iteration between the researcher and participants resulting in the shared understanding of the subject matter.

The interpretive epistemology is more suitable for this research as it seeks to understand the achievements of benefits through the use of ECM in public sector organisations, as well as the barriers preventing the benefits from being achieved. Interpretivism believes in a subjective reality which has multiple answers and aims to interpret personal views of reality. Therefore, it was considered best to adopt an interpretive approach, since the understanding of benefits achievement and barriers requires data to be constructed.

3.2 Research purpose

The purpose of this study was exploratory in nature as there was little information available about the phenomena studied (Wilson, 2014). This study was exploratory since this research

aimed to explore and understand the achievement of benefits through the use of ECM; identifying the barriers preventing the expected benefits from being achieved in public sector organisations. The following section gives a brief overview of the research approach that was used during the study.

3.3 Research approach

There are two research approaches in IS which are qualitative and quantitative research. Qualitative research is designed to assist researchers to understand the views of people and the socio-cultural phenomena within which they live (Myers, 2013). The goal of this research is to understand what benefits are achieved through the use of ECM and why the expected benefits have not been achieved in public sector organisations. Based on the nature of this investigation, it was decided that the qualitative research method would be the best approach, as it is the method that assists in exposing and comprehending what lies behind the phenomenon of which little is known (Corbin and Strauss, 1990). From what was gathered through the literature review, it became clear that little is known about the benefits of using ECM, as well as why the expected benefits are not achieved in public sector organisations. Qualitative data provides in-depth knowledge and understanding of the insight involved in the achievement of benefits in public sector organisations or the lack thereof.

3.4 Research timeframe

The time and resources available for this study were appropriate for a cross-sectional approach in that data was collected at a particular time. A cross-sectional approach is stated to involve a close analysis of a situation at one particular time to provide a snapshot of results (Sedgley, 2007). Meanwhile, longitudinal studies require an extended period to collect the data and make changes. Cross-sectional research takes less time and usually costs less (Levin, 2006) and, given the fact that a Master's thesis takes a maximum of two years to be completed, a cross-sectional research study was ideal. The following section provides an overview of the research strategy used in this research that was adopted.

3.5 Research strategy

Case study research has been found to be an appropriate research strategy for making sense of, or interpreting, the phenomena, in terms of the meanings people bring to these phenomena. Therefore, this study adopted a case study research strategy. A case study is defined as an empirical enquiry within a real life context that investigates a contemporary phenomenon in cases where the boundaries between the phenomenon and context are not clearly evident (Yin, 1994).

A case study research strategy is conducted using a single case study or multiple case studies. In this research, two case studies were conducted independently. A multiple case study strategy is recommended to strengthen the research findings (Yin, 1994). Furthermore, a multiple case study approach provides a basis for robust theory development, since the findings are emerging from a variety of data sources (Yin, 1994). This was therefore suitable for exploring a new phenomenon relating to ECM benefits and barriers preventing the benefits from being fully achieved. There was no detailed cross-case analysis done but, in instances where there were contradicting views and areas in the findings that required to be compared, these were discussed accordingly.

3.6 Target population and sample

Literature indicates that public sector organisations do not always achieve the expected benefits through change initiatives (Bartlett, 2006). Project managers involved in the implementation of an ECM system in the two public sector organisations were targeted as they were the ones the researcher thought would have relevant information. Purposeful and convenience sampling was used in selecting the organisations. The intent of purposeful sampling is to identify cases that are strategically related to the purposes of the study, as this is necessary for the generalisation of case study results (Flyvbjerg, 2006). Purposeful sampling was used in identifying cases that were strategically related for generalisation of case study research. The researcher exercised judgment in selecting the participants for the interviews, based on the minutes of the meetings.

It might be assumed that there will be a sampling bias as the sample is not a representation of the entire population (Thompson, 1999). However, in qualitative research this is not a concern, as the research is not being generalised to a population but to the theory or context (Yin, 1994).

Convenience sampling is one that uses a selection of data that is more easily available at the time of data collection. Convenience sampling is commonly used in qualitative research as it cannot be avoided altogether (Burnard, 2004). Due to time constraints the researcher sampled organisations that were easily accessible. The following section explains the approach to theory followed in building a conceptual framework.

3.7 Approach to theory

The research approach was partially deductive as it used a theoretical model gathered from literature in terms of collecting the data. In the process of collecting data and analysing it, there was new knowledge gained. When new knowledge is gained from the field, an inductive approach is used as it aims to build theory based on the results of the data analysed (Nickerson, Varshney and Muntermann, 2013). In this study, there was new knowledge that emerged from the data analysed, hence the inductive approach was also used. Therefore both deductive and inductive research approaches were used in this study. The section that follows explains how data was collected.

3.8 Data collection

In this study, data was collected through semi-structured interviews and by viewing organisational documentation (Yin, 1994) in both case studies. The next section explains the two data collection methods in detail.

3.8.1 Semi-structured interviews

Semi-structured interviews were used to guard against personal bias, since a shared conclusion from multiple sources is a more reliable one (Morse, 2007). Therefore, such interviews are an appropriate means of collecting qualitative data and are commonly used in case studies (see Appendix D: interview questions). Indeed, semi-structured interviews are part of most qualitative interpretive studies and are reliable means for getting the views of the

participants in the field (Myers and Newman, 2007). Qualitative interpretive studies are characterised by being flexible, iterative and continuous, rather than being locked into a specific scope (Rubin and Rubin, 1995).

Before each interview commenced, the researcher read what was written in the interview consent form and participants were requested to sign the form (see Appendix A) which detailed the research objectives and the participants' right to confidentiality. All the interviews were scheduled at the participants' convenience, namely day, time and venue. At the beginning of the interview, the researcher sought permission to record the interview, indicating that the recording would only be used by the researcher to help analyse the data collected. The researcher recorded all the interviews. Recording the interviews allowed the researcher the opportunity to return at any time to the transcript and to extract direct quotes.

At the end of each interview, the researcher transcribed the recording into a Microsoft Word document and later analysed the data in Microsoft Excel. The interviews were transcribed and documents collected as suggested by (Jebreen, 2012). All the documents collected are shown in Table 3.

Between March and December 2015, a series of interviews was conducted featuring two public sector organisations with a total of eleven participants (see Table 3). The interviews lasted 30 to 45 minutes each. In Table 3, C1 represents the first case study and C2 the second case study and both these cases will be explained in detail in Chapter 4. As can be seen in Table 3, there were six participants interviewed from the first organisation and five in the second organisation. The individuals interviewed had different job titles within their respective organisations and had different roles that they played in the implementation of their ECM systems. Senior management were involved at the beginning of the process and documents were used to determine how the decisions were made.

Table 3: List of participants interviewed

Participant Code	Organisation	Participant involvement/role in ECM	Job Title
P1	C1	End user	Business analyst
P2	C1	End user	Solutions architect
P3	C1	End user	Executive assistant
P4	C1	End user	Document and records management officer
P5	C1	End user	Management system co-ordinator
P6	C1	Was a champion of the system/Project Manager involved in the ECM implementation	Manager
P7	C2	End user	Administrator
P8	C2	End user	Administrator
P9	C2	End user	Manager
P10	C2	End user	Administrator
P11	C2	Was a champion of the system/ Project manager involved in the ECM implementation	Manager

3.8.2 Review of organisational documentation

The researcher sought permission from each organisation to collect and analyse any documentation relating to ECM implementation. Documents that were provided included minutes of meetings, minutes of weekly status meetings and project charters. With these documents, the researcher was in a position to appreciate how ECM implementation transpired. Similarly, these documents assisted in selecting appropriate participants to interview. Table 4 outlines the documents used for triangulation purposes in both case studies.

Table 4: Data Sources – case studies 1 and 2

Code	Year	Organisation	Document description
DC1	2007	C1	ECM hardware discussions minutes
DC2	2007	C1	Migration issues report
DC3	2007	C1	Project charter finalisation minutes
DC4	2015	C2	Business case motivation for Faculty Handbooks Project
DC5	2013	C2	Stakeholder analysis grid list
DC6	2015	C2	Communication plan
DC7	2014	C2	Project charter

3.9 Data analysis

Data analysis is carried out to test whether the data is consistent with the prior assumptions, theory or hypothesis identified by the researcher (Cavanagh, 1997). Thematic analysis was chosen over content analysis because content analysis, although it is a flexible and useful method for a variety of researchers, still lacks firm definition (Tesch, 1990). Content analysis is used for examining trends and patterns in documents which was not the objective of this study.

In Appendix F, a sample of coded themes is provided which illustrates how the themes have changed over time. From the sample selected, it is clear that there were themes that have changed, for example, 'quality improvement' as a theme has been renamed as 'improved content management'. Similarly, the original theme of 'cost reduction' has since been renamed as 'cost cutting'. In contrast, there were themes that did not change, for example, the 'empowerment theme'.

The evaluation of this study was based on set principles by Klein and Myers (1999). The motivation of using these principles is because this study is interpretive in nature and these principles present a more comprehensive approach to methodology justification of an interpretive field study (Walsham, 2006). This section of the study summarises the key results of the analysis, based on the principles set by Klein and Myers (1999), with a particular focus on the hermeneutic circle.

Hermeneutic circle is the first principle which suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form (Klein and Myers, 1999). In this study, it was evident that participants defined words differently and the researcher had to make sense of the meaning the participants assigned to the benefits derived from using ECM. For example, one participant explained the benefits accruing to employees from the use of the ECM system. "I think the benefit is not to remember where I've saved my document" (P1, C1). The researcher established meaning from the parts obtained from the participants which were later developed into a holistic understanding of the benefits of ECM. Meaning was established through an iterative process from the interviews with participants, repeatedly readings of interview transcripts and secondary data. As such, the researcher was able to understand the benefits that are associated with the use of an ECM system.

Principle of contextualisation – According to Klein and Myers (1999), this requires a critical reflection of the social and historical background of the research setting, in order to determine how the current situation under investigation has emerged. Secondary data was used to establish an understanding of the background of the sampled organisations. The details included the services of the organisations and the business processes which the ECM was using. In addition, the participants were asked to describe the background to the implementation of the system.

Principle of interaction - According to Klein and Myers (1999), this requires a critical reflection on how the research materials were socially constructed through the interaction between the researchers and participants. In this study, the researcher conducted interviews and the results showed that the interaction with the public sector organisations was mainly in face-to-face interviews and the organisational documents were requested to be sent over the phone. Sometimes email communication interaction was used in scheduling the interview times. During this process, the researcher was cautious not to influence the outcomes of the responses from the participants.

Principle of generalisation – This refers to the idiographic details revealed by data interpretation through the application of principles that describe the nature of human understanding and social action (Klein & Myers, 1999). This principle was considered in devising concepts that were emerging from the data analysis. The key focus was developing richer explanations of the benefits derived from using ECM in a specific context.

Principle of dialogical reasoning –This requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and the actual findings (Klein and Myers, 1999). The physical arrangement with participants was focused on arriving at an understanding of benefits.

Principle of multiple interpretations – This requires sensitivity to differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study (Klein & Myers, 1999). The use of a semi-structured interviews provided diversity of meanings assigned to the benefits of ECM in public organisations.

Principle of suspicion – This requires sensitivity to possible biases and systematic distortions in the narratives collected from the participants (Klein & Myers, 1999). In this study, semi-structured interviews were used to guard against personal bias, since a shared conclusion from multiple sources is a more reliable one (Morse, 2007). Both the organisations were keen to allow their employees to be interviewed, but the employees were not available at the time of the interview and this was observed as suspicious.

The analysis was a cross-case analysis using the two case studies and, within each case study, deductive and inductive thematic analyses were conducted. A visual view of the cross-case analysis of the two case studies can be seen in Figure 6.

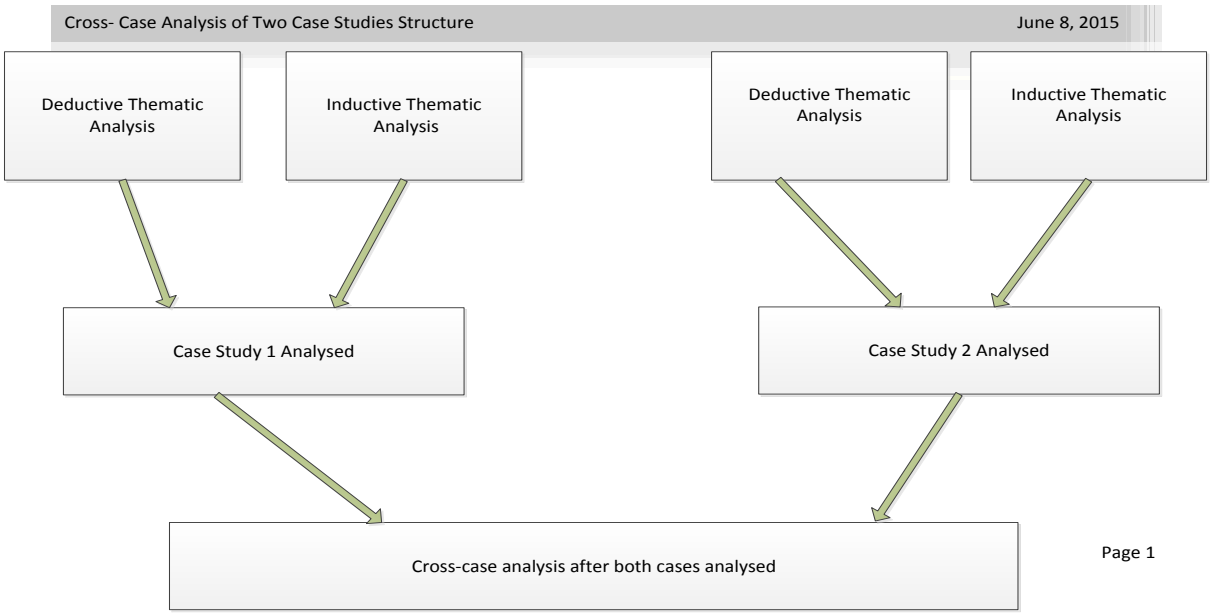

Figure 6: Cross case analysis structures (Braun and Clarke, 2006)

Figure 6 is a structure for an analysis method for multiple case studies that checks for patterns across cases (Noor, 2008).

Cross-case analysis is able to assist the researcher with transferability of findings in order for them to be applied to a different context (Yin, 2009); its weakness, however, is the fact that knowledge could be lost when the two cases are combined (Eckstein, 2002). Nevertheless, the thematic analysis was used to analyse each individual case and it involved the identification of research themes that related to one or more research questions. Themes capture something important about the data in relation to the research question and represent some aspect of patterns found in the research data (Braun and Clarke, 2006).

3.10 Ethical considerations

Ethical considerations are important for the researcher, for the two case study organisations and for all participants. Therefore, it was important for the researcher to state ethical considerations (Roode, 2008).

This study was an interpretative research; ethics and values play a critical part as no group values can be assumed to be more significant than the others (Fossey, Harvey, McDermott, and Davidson, 2002). Thus, this research ensured that people's values were not compromised and were taken into consideration at all times. The research was not structured in any way that was harmful to any participant (Johnston, 2011); this was confirmed by the relevant party Faculty Ethics Committee.

During the interviews, all participants were treated with respect at all times and any participant was allowed to withdraw from the interview at any point if they were not comfortable with the questions. No participant was compensated financially to participate in the interview. However, to encourage the participation of the organisation, a copy of the final publication of the study was promised to be distributed to both public sector organisations on request.

The names of the organisations and the participants were represented by pseudonyms in order to keep them anonymous (Ellis, 2007).

3.10.1 Ethical approval

A technical report, signed ethics form and the research instruments were submitted to the relevant party for approval. The Faculty Ethics Committee assessed the submitted papers and an approval letter was sent to the researcher to commence with the study. Due to the unwillingness of the second case study organisation to participate, the researcher had to identify another organisation that was using ECM. Accordingly, the researcher had to seek for further approval to use a different organisation and permission was given to conduct this study. The Commerce Faculty Ethics Committee's approval letter is shown in Appendix B.

3.10.2 Confidentiality and consent

The researcher sought permission to carry out an academic study from two public sector organisations that were using an ECM system. An email with an invitation letter (see Appendix C) was sent to the Human Resources office of both public sector organisations.

The participation forms were not emailed to the participants but, at the beginning of each interview, the researcher read out the objectives of the study and explained the confidentiality matters, after which the participants were requested to sign the consent form. Confidentiality matters included the following:

- The participants were advised that their names would remain anonymous.
- The names of organisations participating in the research would not be published.
- The participants were advised that they were free to withdraw at any point during the interview.
- Participation was voluntary.

3.11 Ensuring research quality and rigour of qualitative research

To ensure quality and rigour in qualitative research, clear justification for the methods used, findings and conclusions are given. To improve quality and rigour in qualitative research, thorough explanation of the steps taken needs to be described. There are four criteria used to ensure quality and rigour during qualitative research; these are credibility, transferability, dependability and confirmability (Anfara, Brown and Mangione, 2002).

The next section describes each criterion and how it has been used in this research.

- **Credibility** – this includes long engagement periods in the field, the use of peer debriefing, triangulation, member checks and time sampling (Anfara et al., 2002). However, during this research, the researcher collected data at two different sets of time. Triangulation was ensured through gathering data from multiple data sources which included the literature, interviews and organisational documents. The researcher has a post-graduate diploma in Business and Systems Analysis with seven years of experience.

- **Transferability** – this includes providing thick description and purposive sampling (Anfara et al., 2002). During this research, transferability was ensured through using quotes from interview transcripts. Purposive and convenience sampling were used, where purposive sampling identified cases that were strategically related to the purposes of the study for the generalisation of case study results. Convenience sampling, as mentioned, is one that uses a selection of data that is more easily available at the time of data collection. Two public sector organisations that had implemented and were making use of the ECM systems were selected. Participants included managers who were champions/project managers involved in the ECM implementation process from both organisations selected. Other participants included end users who held different job roles. There were eleven interviews conducted and the interviews took 30 to 45 minutes each.

- **Dependability** – this includes creating an audit trial, code/recode strategy, triangulation and peer examination (Anfara et al., 2002). However, there was no audit trial for the purposes of this research. Triangulation was used as data was collected through interviews and from organisational documents. Interviews were transcribed using Microsoft Word and the themes that emerged were further coded in Microsoft Excel. The code and recode strategy involved the researcher coding the same data twice, giving one or two weeks' gestation period between each coding. The results from the two coding were compared to determine whether the results are the same (Chilisa & Preece, 2005). This assisted the researcher to gain a deeper understanding of data patterns which improved the participant's narrations.

- **Conformability** – this includes triangulation and practice reflexivity (Anfara et al., 2002). To achieve this, the researcher took steps to demonstrate that findings emerged from the data and not the researcher's own predispositions. As such, in the data analysis process, the researcher allowed meanings to emerge from the data and was cautious about not influencing the results. Triangulation was used to reduce the effect of investigator bias.

3.12 Limitations of the study

Just as in any other study undertaken, there were assumptions and limitations to this research. This section discusses the various assumptions and limitations regarding the completion of the study. The following are a number of key assumptions considered:

a) This research had a significant value to public sector organisations that needed to understand the achievement of benefits through the use of ECM systems.
b) The researcher was rational rather than subjective in the assessment and analysis of the data.
c) The individuals interviewed were representatives of the entire organisation.

There were a number of key limitations that were considered:

a) There was limited relevant information from the literature review as there have been very few studies performed in public sector organisations pertaining to achievement of benefits through the use of an ECM system.
b) This study focused only on public sector organisations using ECM systems and, because of time and research scope, not everyone in the public sector organisations was interviewed. More work can be done on the phenomenon under investigation.
c) At first, individuals were reluctant to participate in the interviews.
d) Top management employees from both cases were not available to be interviewed; however, secondary data was used and further research can be done.
e) Lastly, the unavailability of top management somehow limited the research findings, as the participants interviewed from both cases were not able to answer some of the questions. For example, the participants were unable to provide an answer for how

much IT cost reduction had been as a result of using an ECM system. As a result, question 5.2 was not answered, as the researcher had expected.

3.13 Summary of Chapter 3

This chapter has presented the research methodology used in the study. The nature of the problem being investigated was best addressed with a qualitative research method. In terms of philosophy, the research followed an interpretive paradigm and a case study research strategy. As this study was for a specific period, a cross-sectional study was more suitable than a longitudinal study. The research purpose adopted was exploratory. The next chapter presents and discusses the findings of the study.

Chapter 4: Findings and analysis

The aim of this chapter is to present the findings from an empirical study conducted in two separate public sector organisations. This chapter is meant to answer the question about what the benefits and barriers of an ECM system are. The chapter is organised as follows. Section 4.1 discusses diversity within the research, highlighting the number of case studies that were involved. Section 4.2 then discusses the case descriptions. This is followed by Section 4.3 where the ECM benefits that have emerged from the research are identified and discussed. Thereafter, Section 4.4 shows the ECM benefit's framework and Section 4.5 discusses the causal benefit. This is followed by Section 4.6 that discusses the barriers to the successful implementation of ECM systems which emerged from the research. Section 4.7 discusses the emerged barriers framework. The last section provides a summary of the findings.

4.1 Diversity within the research

In the interest of gathering diverse perspectives, the researcher conducted eleven (11) interviews in two public sector organisations. The eleven interviews conducted were split into six participants from one organisation and five participants from the second organisation. The selected organisations were public entities with different organisational cultures and sizes.

Table 5 summarises the case studies used in terms of the industry sector and geographic location, as well as showing the previous technologies used before the implementation of an ECM system. The participants were labelled P1-P11 as explained in Chapter 3 previously.

Table 5: Case Study Summary

No. of participants	Industry sector	Organisation	No. of documents viewed	City	Previous technology
6	Public sector	C1	4	Port Elizabeth	Manual system
5	Public sector	C2	2	Cape Town	Manual system

4.2 Case description

The purpose of this section is to provide a description of each case investigated. There were six interviews conducted in a public sector organisation based in the city of Port Elizabeth and five in a public sector organisation based in the city of Cape Town. Both of these organisations are public entities and were using an ECM system at the time of the study.

4.2.1 Case 1 (C1)

C1 represents the first public entity used in conducting the research. C1 is a state-owned entity that is wholly owned by the South African government. It is a well-established medium-sized organisation. It is aimed at reducing poverty, unemployment, inequity and improving the livelihood of communities. It is a multi-billion rand industrial development complex, customised for heavy, medium and light industries. As part of its services, it provides a competitive investment location and it facilitates value-adding commercial business solutions. Before ECM was introduced into the organisation, all employees stored organisational documents on their assigned computers and to the company server. However, the documents uploaded on the server were not saved in any particular format. The documents could be accessed by any individual in the organisation, regardless of their position. As time progressed, the need for a properly integrated company-wide repository system became compelling and an ECM system was implemented.

The implementation of an ECM system was intended to address the uncontrolled manner in which documents were saved, stored and accessed by employees. It became apparent that, with an ECM system, an employee was still able to upload documents with viewing rights, although it could not be accessed by everyone within the organisation. As explained by P4: "W*hen you upload documentation into the system, you can upload it with viewing permissions so not everybody has access to certain documents so from that respect you've got your security protected and sensitive information. . .*".

During the ECM adoption process, no formal business case was completed, and there were no clear roles identified upfront (DC3 in Table 4). Even graduate trainees with no experience were part of the implementation process for their own career growth purposes (DC3 in Table 4). It was at a later stage that the business case was drafted by the service provider and not the company. C1 did not have a copy of the business case. The project was justified in a series of

meetings, discussions and workshops between the ECM vendor and the company's Information Communication and Technology (ICT) managers. The meetings were attended by vendor representatives, namely, the ECM project manager, programme manager and integration manager. Meanwhile, the public entity had three managers who were alternative attendees in every meeting held.

The need to migrate from a centralised but uncoordinated uncontrolled information repository to an ECM system arose in 2007, whereupon a procurement process was initiated and a tender was advertised for the ECM implementation. Initially, the tender did not mention any operating system that would be used for the functionality of the ECM system (DC1, in Table 4). It was during the negotiation stage that the vendor suggested using a Windows operating system rather than using the Linux operating system (DC1, Table 4). The Windows operating system was chosen because it was easier to install content management in it. It was reported that Windows was more expensive than Linux-based systems and that the Linux company appointed might not give a high priority to fix and repair issues that may have occurred (DC1 in Table 4). It was from these discussions that the ICT managers in the public sector organisation decided to use the Windows operating system for their ECM implementation.

A technology platform may either be an open source or proprietary. Linux operating system is an example of an open source platform whilst Microsoft Windows is an example of a proprietary platform (Economides & Katsamakas, 2006). A proprietary platform was used for the implementation of the ECM system in C1. This eliminated the costs of paying for training, installation and maintenance which would have been the case (Economides & Katsamakas, 2006).

As consensus was reached on what operating system to use, the migration stage commenced (DC1 in Table 4). The documents in the old information repository were migrated to ECM and the implementation stage was completed in July 2008 (DC2 in Table). This was the ICT managers' first experience with an ECM implementation. C1 had been using ECM for more than seven years and the organisation had about 255 staff members at the time of the ECM implementation.

4.2.2 Case 2 (C2)

C2 is a formal academic institution, also owned by the South African government. C2 has a proud tradition of academic excellence and effecting social change and development through

its pioneering scholarships, faculty and students. As part of its services, it strives to provide a superior quality education experience for both undergraduate and postgraduate students, through exposing them to the excitement of creating new knowledge, stimulating the love of long life learning, to just name a few. One step that C2 took was the decision to implement a content management solution for the faculty handbooks. This was triggered by the existing cumbersome process of compiling annual releases of faculty handbooks and the amount of content duplication caused by the various departments working independently (DC4 in Table 4).

A special committee was formed comprising a content architecture team, academic administrators and faculty managers. The project took 18 months before the recommended system was implemented and put out live.

The content management system, which was required for the preparation of faculty handbooks, was first rolled out in five faculties within the organisation (DC5 in Table 4). Before the ECM system was implemented, the handbooks (which are now stored and edited electronically on the ECM system) were prepared manually by each faculty/department and this led to content duplication as people were working in silos. According to the administrator (P7), the ECM system was implemented so that everything could be loaded and changed centrally, thus avoiding people working in silos and thus achieving greater administrative efficiency.

C2 identified the benefits of using an ECM system in a public sector organisation as reduction on the amount of duplication of the handbook content, consistency of content and time saving. Moreover, all these benefits were mentioned during the interview section.

4.3 Research findings: benefits

This section presents the findings that emerged from the study. The findings are divided into ECM benefits and ECM barriers; these were analysed independently. The benefits were the first ones analysed, followed by the barriers. The benefits that emerged were divided into five categories, namely, independent central repository benefits, safe and secure storage benefits, cost cutting benefits, facilitation of organisational learning benefits and productivity improvement benefits. The barriers that emerged from the study will be discussed in detail in the following section.

Whilst executing the study, there were instances where the participants could not explicitly indulge in a debate about the benefits of using an ECM system. For example, when one of the participants was asked to state the IT infrastructure benefits associated with the use of ECM, she struggled to answer, due to the fact that the participants were not involved in the implementation process. It was mentioned that training had been done a long time before they actually used the system, therefore some people had forgotten how the system worked. As the interviews progressed, the participants made comments pertaining to the training provided and some of these are quoted below:

"Even though we got training it was also necessary to get refresher training" (P7, C2).

"The training took place in such a long time before we did the actual handbook and I think that was difficult to some people because they have forgotten" (P9, C2).

This means that the training was provided well before the users actually had the opportunity to use the system and this led to some people forgetting how to use the system. There was even a suggestion by one of the participants that training should only be done about a month before the uploading of handbooks onto the system.

Table 6: ECM benefits

	Benefits of using ECM		Number of text excerpts		Number of respondents	
	Benefit Category	**Theme**	**Count: C1**	**Count: C2**	**Count: C1**	**Count : C2**
1	Independent central repository	Less duplication	1	4	1	2
		Ease of document retrieval	8	7	4	3
		Central storage point	14	21	6	5
		Less reliance on people	7	4	4	2
2	**Productivity improvement**	**Improved decision making**	4	0	2	0
		Collaboration	4	5	2	3
		Faster retrieval	11	3	4	3
		User friendly	2	7	2	4
3	**Facilitation of organisational learning**	**Empowering individuals**	3	2	1	3
		Retaining organisational memory	6	3	3	3
4	**Cost cutting**	Reduced printing	12	13	6	5
		Reduced energy consumption	1	0	1	0
		Reduced storage costs	3	0	2	0
5	Safe and secure storage	Compliance	12	0	5	0
		Controlled access to content	16	2	6	2

Table 6 provides a summary of benefits evident in each case, assessed through the total number of text appearances found in the transcripts per case and the total number of participants mentioning the benefits in each case. The data in Table 6 is only made up of the data collected during the interview sessions. The themes that were mentioned in the literature and those which have emerged in the study are highlighted in bold. The themes that are not highlighted in bold are newly emerged benefits themes. Based on the data presented in the table below, 22% of the benefits were experienced and 78% were not found.

Table 7: Matching of benefits derived from the literature with emerged benefits

BENEFITS FRAMEWORK		
DIMENSIONS	**SUB-DIMENSIONS**	**THEME**
1. Operational	**1.1 Cost reduction**	**Reduced printing, reduced energy consumption, reduced storage costs**
	1.2 Cycle time reduction	**Ease of document retrieval**
	1.3 Productivity improvement	**Productivity improvement**
	1.4 Quality improvement	**Better consistency in the content**
	1.5 Customer service improvement	Not found
2. Managerial	2.1 Better resource management	Not found
	2.2 Improved decision making and planning	**Improved decision making**
	2.3 Performance improvement	Not found
3. Strategic	3.1 Support for business growth	Not found
	3.2 Support for business alliance	Not found
	3.3 Building business innovations	Not found
	3.4 Building cost leadership	Not found
	3.5 Generating product differentiation	Not found
	3.6 Building external linkages	Not found
4. IT Infrastructure	4.1 Building business flexibility	Not found
	4.2 IT cost reduction	Not found
	4.3 Increased IT infrastructure capability	Not found
5. Organisational	5.1 Changing work patterns	Not found
	5.2 Facilitating organisational learning	**Facilitation of organisational learning**
	5.3 Empowerment	**Empowering individuals**
	5.4 Building common vision	Not found
	5.5 Horizontal co-ordination	Not found
	5.6 Vertical control	Not found
	5.7 Size, scope and product domain	Not found
6. Employees	**6.1 User friendly**	**User friendly**
7. Environment	7.1 Stakeholders	Not found
	7.2 Inter-organisational relations	Not found

Table 7 shows the matching of benefits derived from the literature with the benefits that emerged from the study. The classification of such benefits is broken down into operational,

managerial, strategic, IT infrastructure, organisational, employees and environment. The sub-dimension shows the ERP benefits derived from the literature, whilst the column named 'Theme' shows the ECM system benefits that were found during data collection as well as those that were not found. From the analysis, it was clear to note that the themes were classified differently in the literature and the analysis process. For example, in literature, the cost reduction benefits were named cost cutting. Furthermore, cost cutting in this study was split into reduced printing, reduced energy consumption and reduced storage costs.

Improved decision making, productivity improvement, facilitation of organisational learning and empowering individuals were the other themes that were identified in the literature and also emerged from the study. However, productivity improvement, facilitation of organisational learning and cost cutting in the literature, were classified as main themes, but emerged as sub-themes in the study. From the 27 sub-dimensions mentioned in the literature, only eight emerged from the study.

The benefits found were mainly found under operational and organisational categories. In total, there were five themes that emerged from the study and the rest of the themes were not found. However, new themes that emerged from the study will be discussed in the next section.

4.3.1 Independent central repository

Independent central repository benefits comprised those which the public sector organisation valued when using an ECM system for document retrieval. The implementation of an ECM system was successful in yielding benefits such as less duplication, ease of document retrieval, a central storage point and less reliance on people.

4.3.1.1 Less duplication

Less duplication is one of the themes that emerged during the coding process but was not ranked very highly in both organisations; however, it had a stronger ranking in C2. This theme describes how the public sector organisations experienced having less duplication after ECM implementation and this was evident in both cases. The theme made five appearances in all interviews conducted. The following quotes demonstrate the existence of less duplication in the cases investigated:

"*. . . reduced the duplications . . .*" *(P2, C1).* This participant shared a view that implementing an ECM system resulted in improved content management. The organisation's content was improved in various ways, for example, P2 mentioned there is reduced duplication of documents.

"There is less content that's duplicated" (P11, C2).

Discussion

Due to the automation of administrative processes, the two organisations that implemented an ECM system experienced an improvement in its content. This means that these organisations managed to realise, specifically, improved quality of information. Participants shared the view that an ECM system causes less content duplication. An ECM system had assisted in reducing duplications, for example, as reported by P11, "*They now have sort of a standardised approach and used standardised templates so better consistency in the content with less duplications".*

These findings concur with the previous studies which reported that ECM strives to improve the content in organisations (McKeen and Smith, 2003). This is confirmed by the study in that there is reduced duplication of content throughout the organisation as a result of using an ECM system. This also aligns with another study that less duplication was amongst the identified benefits of an ECM system (Kemp, 2007).

However, it is important to note that the implementation of an ECM system gave these organisations an opportunity to organise their data, while suppressing duplications in the system. When there are no duplicates in the system, data is seen as more reliable and accurate. This finding is indeed consistent with previous studies (Ondrej, 2010; Schubert and Williams, 2010). DC6 shows that a reduced amount of duplication of the handbook content was identified as a benefit of ECM.

4.3.1.2 Ease of document retrieval

One of the goals of an ECM system is to allow users to be in a position to easily retrieve relevant information, in order to facilitate the re-use of knowledge in an organisation. Ease of document retrieval is one of the themes that emerged fairly strongly from the study. Half of

the participants indicated that the use of an ECM system results in ease of document retrieval. The following quotes reveal how this benefit was mentioned:

". . . if they are stored in ECM the benefit is that you can retrieve your documents even though your machine or computer is lost . . ." (P1, C1).

"Information is available and it is accessible" (P5, C1).

"People can access it from everywhere" (P11, C2).

". . . content is easier to find . . ." (P11, C2).

'. . . think the overall impact will be spending less time in working on the handbook . . ." (P8, C2).

Discussion

Nearly all participants shared the view that an ECM system results in ease of document retrieval. P1, for example, mentioned that, even though an employee should loses their laptop, an advantage of an ECM system is the fact that documents are retrievable, as they are stored electronically. These findings agree with the previous studies which reported that an ECM system is used to create backups of critical content in an organisation, thus ensuring no information is lost (Kemp, 2007). This is indeed what P1 emphasised during the interview session.

The findings coincided with the view that the ease of information retrieval is facilitated with an enterprise system (Ondrej, 2010). Analysis suggests that access to information is more efficient and easier when stored electronically and not at the whim of individuals.

4.3.1.3 Central storage point

A central storage point is a theme that emerged strongly from the study with the greatest number of text occurrences. ECM is a tool used for integrating and extending business processes; it provides a single central system ensuring that information is shared across all functional areas (O' Callaghan and Smits, 2005). DC4 mentioned that ECM is aimed at demonstrating that one can edit their content in a centralised location. In this study, all eleven participants interviewed mentioned this theme as a benefit of using an ECM system in public

sector organisations. This was a dominant benefit identified in both the case studies and was mentioned 35 times. The following quotes reveal how this benefit was mentioned:

". . . peace of mind because the documents are saved on the system. Also if they lose a hard copy of the document they still have a copy on the system electronically. So the information is not lost . . ." (P4, C1).

". . . one source of information . . ." (P6, C1).

". . . one system used by all . . ." (P9, C2).

". . . reliable source in a central location . . ." (P11, C2).

Discussion

It is easy to determine from the results that the ECM system facilitated the aggregation of data within the organisations. Thus it was much easier for the various departments to access data held centrally, rather than some data being held separately by each department. The fact that the documents are centralised and saved electronically, the risks of losing documents as a result of a laptop theft, are lower when compared to a manual filing system. In addition, even if a hardcopy document is lost as mentioned by P5, ". . . *one still has a peace of mind knowing that the lost document will still be retrievable"*. Furthermore, *"ECM allows an individual to know exactly what to find where within the system as there is only one place of repository" (P5, C1).*

Analysis suggests that a central storage point results in achieving ease of document retrieval. As explained by P1: ". . . *if the documents are stored in ECM the benefit is that you can retrieve your documents even though your machine or laptop is lost*". The relationship which emerged is shown in Figure 7.

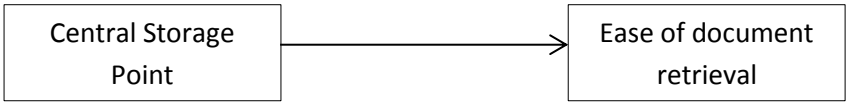

Figure 7: Central storage point can enable ease of document retrieval

Looking at the ECM benefits identified in the literature, a central storage point was experienced by the participants in this study. However, in the literature they referred to central storage point as consolidation and integration (Usman et al., 2009).

4.3.1.4 Less reliance on people

Less reliance on people is another theme that emerged from the study and was not ranked very highly in both organisations. Six participants interviewed mentioned this theme as a benefit of using an ECM system in a public sector organisation and it was mentioned twelve times during the interview sessions. The following quotes reveal how this benefit was mentioned:

". . . access of information from one point and preservation of an organisation's information as opposed to information being kept in personal computers . . ." (P6, C1).

"I think it eliminates that interaction of having to go to someone" (P1, C1).

"I do not have to rely on from someone sitting in the faculty office or student record office" (P10, C2).

Discussion

From the information gathered, it is apparent that the implementation of an ECM system requires less interaction with colleagues and places less reliance on people. This means that, even though an individual is booked off sick, it would still be possible to retrieve and view the document that the individual had been working on. For example, P1 continuously indicated that the use of ECM lessens the interaction and reliance on people. This was further alluded to by P2 and P6 in that, with the use of an ECM system, there is ease of access to information as information is stored in a central repository and not in individuals' computers. The relationship which emerged is shown in Figure 8 below. Users can access the document at any time; if one person is on leave, the same document can be accessed by anyone (P1, C1).

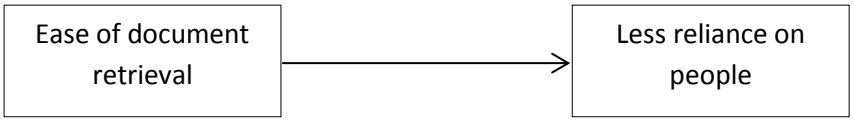

Figure 8: Ease of document retrieval can enable less reliance on people

Less reliance on people was the benefit that was only identified in this study although the researcher found no literature that mentioned it.

4.3.2 Productivity improvement

Productivity improvement occurs when enterprise systems increase work efficiency such as access to information in real time. This main theme was broken down into four sub-themes: improved decision making, faster retrieval, user friendly and collaboration. In the study, productivity refers to access of information for information-reliant individuals.

4.3.2.1 Improved decision making

Improved decision making refers to the ability of individuals to be able to review past resolutions. In the study, improved decision making refers to quicker decisions being made by individuals having received the necessary information in real time. This sub-theme was mentioned four times by two out of eleven participants. The following are some of the quotes that reveal what the participants were thinking:

". . . so as managerial you can go and see what is the current status of that project" (P2, C1).

". . . that management can always see past approved budgets by the board of directors as to what was approved in a certain financial year and they will be able to see some of the notes in the budget and to understand what exactly the approval was for in order to be able to put together their budgets much better, more efficiently and effective . . ." (P3, C1).

From the information gathered, it became apparent that the use of an ECM system improved the manner in which management reached their decisions. Productivity improvement is a result of being able to access documents which make it easier for management to execute its duties such as making decisions.

Discussion

The study results indicate that ECM contributes to the effectiveness of the decision-making process. The results indicate that the decision-makers feel that ECM provides them with better information for making improved decisions. The findings are consistent with the literature which states that the use of ECM for a wider range of business tasks helps to reduce the time needed by decision makers in identifying the problems (Alalwan, Thomas, and

Weistroffer, 2014). This allows the decision makers to react faster to potentially challenging situations. The results show that ECM positively influences decision-making speed and analysis (Alalwan et al., 2014). The relationship which emerged is shown in Figure 9. Management can also go back to past resolutions and decisions that were made in order to make better ones in the future.

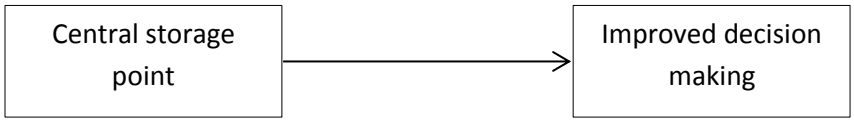

Figure 9: Central storage point can enable improved decision making

From the literature, even though there were no ECM benefits framework available, there were some ECM benefits mentioned – improved decision making was one of the benefits mentioned (Svärd, 2014).

4.3.2.2 Faster retrieval

This is one of the more dominant sub-theme that was mentioned repeatedly by the participants. Set out below are some of the quotes from the participants.

"It actually saves us in terms of time, the overall impact would be efficiency, when I say efficiency I mean doing things quicker . . ." (P3, C1).

"We can say it's time saving . . ." (P1, C1).

Discussion

From the interviews conducted, it became apparent that the ECM system saves time and is efficient – this was recognised by most participants. Efficiency in information distribution (through faster retrieval) has been identified as an important ECM objective (Pullman and Gu, 2007). ECM improves the efficiency with which tasks are performed, as individuals take less time to search for documents (Tyrvainen et al., 2006). Therefore an ECM system does improve the efficiency with which tasks are performed. Furthermore, the participants argued that the use of an ECM system does save time.

4.3.2.3 User friendly

User friendly is a sub-theme that emerged from the study and it was mentioned nine times. The participants supported user friendly as being one of the benefits of an ECM system as the following statements indicate:

"I found it quite user friendly because I use it so often" (P4, C1).

". . . is quite friendly to navigate . . ." (P10, C2).

". . . is user friendliness . . . ." (P11, C2).

Discussion

There was literature available to support the fact that the ECM system is user friendly. However, from this study, the user -friendly theme appeared to be a benefit that was achieved by most of the participants. It also appeared that one of the participants used the ECM system frequently and, for that person, the system was definitely user friendly. Others mentioned that there is a standardised interface, hence it is quite friendly to navigate. They made a point that the more used to the system you got, the easier it became to use it. Shang and Seddon (2002) mentioned that an efficient enterprise system leads to satisfied users. When the users found a system easy to navigate they are normally satisfied and would find the system user friendly.

4.3.2.4 Collaboration

Collaboration refers to the heart of working together by making use of available resources in a harmonious way. This sub-theme was mentioned nine times by five out of eleven participants, thus had a similar ranking to the user-friendly sub-theme. Below are some of the quotes that reveal what the participants stated:

". . . it improving the communication lines that are horizontal and vertical" (P3, C1).

". . .I think it has caused collaboration because people are speaking to one another" (P8, C2).

Discussion

Collaboration in ECM involves a significant amount of engagement between employees, especially in terms of content and knowledge sharing (Paivarinta and Munkvold, 2005). The users can check files in and out of the system and jointly edit them (Wiltzius et al., 2014).

One participant said the following statement when asked about collaboration: "*It has made easier to share documents" (P4, C1).*

The analysis also suggests that a central storage point results in collaboration, as exampled by (P8, C2) who said: "*We probably going to access all the faculty handbooks across the system, I think it will be easy because it is now centralised*".

The relationship that emerged is shown in Figure 10.

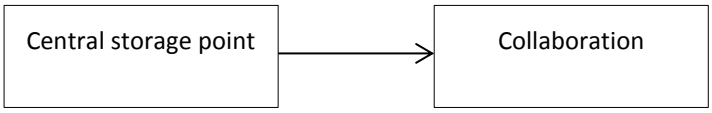

Figure 10: Central storage point can enable collaboration

In validating the ECM benefits identified in the literature, collaboration was also identified as a benefit and, during the interview sessions, the participants also experienced the central storage point to be a benefit of using an ECM system. Furthermore, collaboration allows users to exchange documents, ideas in real time and from remote locations and the information is stored in a central repository where it can be shared (Thomas, 2014).

4.3.3 Facilitation of organisational learning

In this context, the term 'facilitate organisational learning' refers to the manner in which staff gains skills through the use of an ECM system. This section focuses on two sub-themes, namely, empowering employees and retaining organisational memory.

4.3.3.1 Empowering employees

Empowering employees describes how the use of an ECM system assisted in the development of new arrangements in which employees received recognition and the acquisition of IT skills. Only four out of eleven participants indicated that the use of an ECM system results in individuals being empowered; although this was mentioned five times in the interviews, this is one of the lowest ratings for a sub-theme.

Notwithstanding the above, from the information gathered, it is clear that the use of an ECM system has resulted in staff becoming more proficient in their Information Technology (IT) skills, given the fact that the system is used by some on a daily basis. For example, P3 indicated that ". . . *some of the staff actually through the use of ECM they have actually become more proficient in the IT skills seeing that they need to deal with the system on a*

daily basis." P5 also mentioned that the use of the ECM system empowers employees who then acquire additional skills. Others mentioned that the use of an ECM system has added skills in terms of the use of technology.

Discussion

Users were empowered through reskilling and training on how to use the ECM system and some expressed their gratitude for the additional skills acquired. Aligned to this, the employees are empowered by giving them access to more information (Decoster and Zwicker, 2009). In contrast, (McNally, 2010) observed that ECM systems have been criticised for reducing the skills of workers and for encouraging the sub-division and automation of workflow processes. In this study, employees who gained additional skills were indeed grateful to have been granted an opportunity to work on such a system.

"There is a lot of collaboration helping other departments out who didn't know how the online system worked" (P9, C2). This means collaboration results in the acquisition of knowledge.

The relationship which emerged is shown in Figure 11 below.

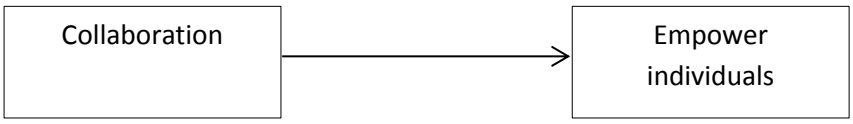

Figure 11: Collaboration can result in individuals being empowered

Empowering individuals was mentioned in the literature as being a benefit; this study also confirmed it to be a benefit experienced by individuals in public sector organisations.

4.3.3.2 Retaining organisational memory

Retaining of an organisation's documents refers to the preservation of the documents. Six out of the eleven participants indicated that the use of an ECM system results in retaining of organisational memory and this was mentioned nine times in the interview. The following quotes show how this benefit was mentioned.

". . . information that is retained within the organisation in case of theft or something like that . . . " (P3, C1).

". . . organisation being able to preserve its memory or depository of knowledge . . ." (P6, C1).

". . . you can use them for records management for retention" (P11, C2).

Discussion

There is literature available to support that retaining organisation memory is one of the benefits of using an electronic document management system (David & Williams, 2005). From the information gathered, it became apparent that the use of an ECM system affords the organisation an opportunity to keep its documents, not only the documents residing with individuals but also the ones that are electronically on ECM. As stated by P3: ". . . *institutional memory of an organisation, where you keep that institutional memory, that it does not only reside with human beings but also to some extent resides within ECM*". This means that, with the use of an ECM system, the organisational memory is retained and that information does not only reside with employees but is stored in the ECM system.

The relationship which emerged is shown in Figure 12. A central storage point can enable organisations to retain their institutional memory.

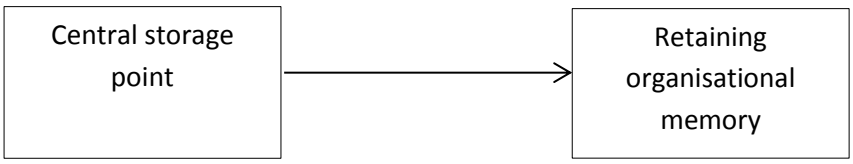

Figure 12: Central storage point can enable retaining of organisational memory

Retaining of organisational memory is an ECM benefit that emerged in this study but was not identified anywhere in the frameworks used. Therefore, this came as a new ECM benefit in this study.

4.3.4 Cost cutting

In this context, the term 'cost cutting' refers to how the public sector organisations have benefited in cutting various costs elements through adopting ECM. This section focuses on two sub-themes, namely, reduced printing and reduced storage costs. The third sub-theme which emerged, namely, reduced energy consumption, will not be discussed as it was only

mentioned once. These findings are in agreement with existing literature in that the use of an ECM system results in cost savings in information processing operations and facilities (Paivarinta and Munkvold, 2005). Having a fully functional ECM system results in cost savings, with information management of essential business functions (Sprehe, 2005).

4.3.4.1 Reduced printing

Reduced printing is one of the most significant of the sub-themes that emerged from the study and was only outranked by the central storage point. All participants indicated that the use of an ECM system results in less paper usage; this was mentioned 25 times in the interviews. The following quotes reveal how this benefit was mentioned.

"The paper, printing, copying sort of exercise ECM I have seen it as a cost reduction . . ." (P3, C1).

"There is cost reduction in terms of not printing the books or reducing the printing" (P8, C2).

". . . there is less content being printing . . ." (P11, C2).

In general, all participants shared a view that implementing an ECM system results in cost savings and these costs were saved in various ways. From the information gathered, it became apparent that the use of an ECM system reduces paper consumption and every participant mentioned this. Others even indicated that the use of ECM assists in avoiding the chopping down of trees; documents do not need to be printed as all documents are saved in the system and all exchanges can be done electronically.

Discussion

Sprehe (2005) argued that implementation of ECM systems results in reduction of paperwork and more reliance is put on automated processes. In support of this, one participant commented: "*The paper, printing, copying sort of exercise ECM, I have seen it as a cost reduction" (P3, C1).* The findings indicated that once an ECM system is fully utilised by staff in public sector organisations, there will be less paper consumed.

The implementation of an ECM system results in paper saving which is environment friendly (Ondrej, 2010). This study found that the implementation of an ECM system leads to cost

reduction through paper saving. This also came up in the interviews as there is less printing by employees because documents are now saved on the ECM system. In contrast, even though digitising paper archives can save departments storage room and money, the corollary is that there will be extra effort for the offices that have to scan the paper records. If these offices cannot see the benefits, then it is likely that ECM introduction could be resisted (Simons, vom Brocke, Lässer, and Herbst, 2014).

Analysis suggests that a central storage point results in reduced printing, as noted by one participant who said: "*ECM helps to avoid killing of plants by printing the documents as documents are saved into a system" (P2, C1).*

The relationship which emerged is shown in Figure 13. A central storage point can result in reduced printing.

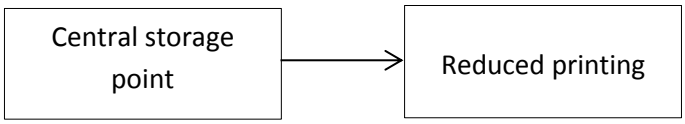

Figure 13: Central storage point can result in reduced printing

4.3.4.2 Reduced storage costs

A reduced storage cost is one of the sub-themes that emerged from the study but had one of the lowest ranking for a sub-theme. Only three out of eleven participants indicated in the interviews that the use of an ECM system results in saving physical and computer hard-drive space. The following show how this benefit was mentioned.

"All the documents on ECM are in servers and it's not using up your computer space which means you do not have to spend money on your hard drives so from that aspect I would say there is a cost reduction" (P4, C1).

"*Instead of saving in a centralised information repository we save it directly onto ECM that is a cost saving because we do not have to purchase extra servers as information escalates*" *(P5, C1).*

It was only C1 employees that raised this benefit; it was not mentioned at all by C2 employees.

Discussion

From the information gathered, it is apparent that an ECM system has the benefit of saving physical and computer hard-drive space. Physical space is saved in that there is no need for keeping files in a fire-proof store room or on your computer hard drive as all the documents are saved electronically. For example, P5 mentioned that "*Instead of saving documents in a centralised repository as before, everything is saved directly onto ECM and that is a cost saving because there is no need to purchase extra servers as information escalates within the organisation*".

In the literature it was mentioned that reduced storage cost is a benefit of an electronic document system (Johnston & Bowen, 2005).

4.3.5 Safe and secure storage

In this context, the term 'safe and secure storage' refers to the manner in which the organisation's confidential documents are controlled and ensures compliance with a set of rules and regulations. This section focuses on two sub-themes, namely, compliance and controlled access to content.

4.3.5.1 Compliance

Compliance refers to adherence to standards of practice and describes how the ECM system assisted the public sector organisations to ensure that their practices were within the recommended standards. This theme emerged from the study and five out of eleven participants interviewed mentioned this theme as a benefit, while it was mentioned 12 times during the interview sessions. The following extract from the interviews show how this benefit was mentioned:

"It also allows you the opportunity to work strictly with the government archiving criteria with regards to retention dates so your specific records have to be kept for specific periods for example your invoicing and contracts have to be kept for five years and your medical records have to be kept for life" (P5, C1).

Discussion

In general, participants shared the view that greater ease of compliance is one of the benefits of using an ECM system. The participants in C1 stated that the organisation is affiliated to the

ISO standard which ensures that all documents have relevant standard templates. ECM has also added value in ensuring that the documents have the integrity they should have, in that each saved document has a unique number for ease of reference (P3, C1).

Compliance has been identified amongst the benefits in previous studies (Alalwan and Weistroffer, 2012; Kunstova, 2010). The use of an ECM system assists the organisations to be compliant with government regulations and standards and enhances organisational reputation and competitiveness in the marketplace (Nordheim and Päivärinta, 2006).

4.3.5.2 Controlled access to content

Controlled access to content looks at who has access to what file or document within the organisation. From the information gathered, it is apparent that an ECM system controls access to documents and therefore only authorised individuals can access certain documents. For example, P1 mentioned that access to documents is generally based on the department that the person is working in. As an example, if employee A works in the finance department then that employee will not be able to access documents from another department and vice versa. Eight participants interviewed identified this theme as important and it was mentioned 18 times during the interview session. Again, interestingly, C1 mentioned this as one of the most important sub-themes whilst C2 responded in a lower key. The following quote shows how this benefit was mentioned:

"We have many legal documentations such as agreements, which are sensitive documents. . . now if you've got a hard copy and you are a project manager and it's your agreement and you've got a hard copy laying on your desk somebody can come in and access that document and they can take it away and you have lost the entire contract. But if it's on ECM system you would store the document safely and be on your computer and its quite safe on the system nobody can access unless of course they have got permissions" (P4, C1).

Discussion

An ECM system is a key driver when it comes to the protection of content against unauthorised access (Chiu and Hung, 2005). With an ECM system, content is shared with the right people at the right time and individuals see only relevant information (Dirking and Huff, 2010). Controlled access to content is one of the main benefits of using an ECM system and it was mentioned 18 times in the interviews.

Analysis of the findings show that having a central storage point can facilitate controlled access to content as exampled by (P2, C1) who said: "*Departments can have a folder on ECM which they can share only to specific business unit (BU) and can restrict the right to specific group of people*". This means that, even though the information is stored electronically and is available, not everyone will have access to all documents stored.

The relationship which emerged is shown in Figure 14. A central storage point can result in controlled access to content.

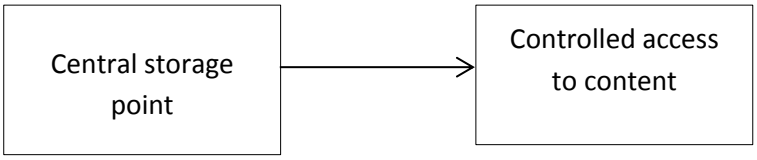

Figure 14: Central storage point can result in controlled access to content

Controlled access to content was identified as an ECM benefit because, with this system, content is shared to the right people, at the right time, and one sees only relevant information.

4.4 Discussion: Emerged Benefits Framework

The diagrams which emerged from the benefit themes were all integrated into a final framework, referred to in this study as the ECM Benefits Framework shown in Figure 15. From the ECM literature, there were five benefits identified, namely, cost and efficiency, compliance and security, continuity, consolidation and integration, collaboration and customer service.

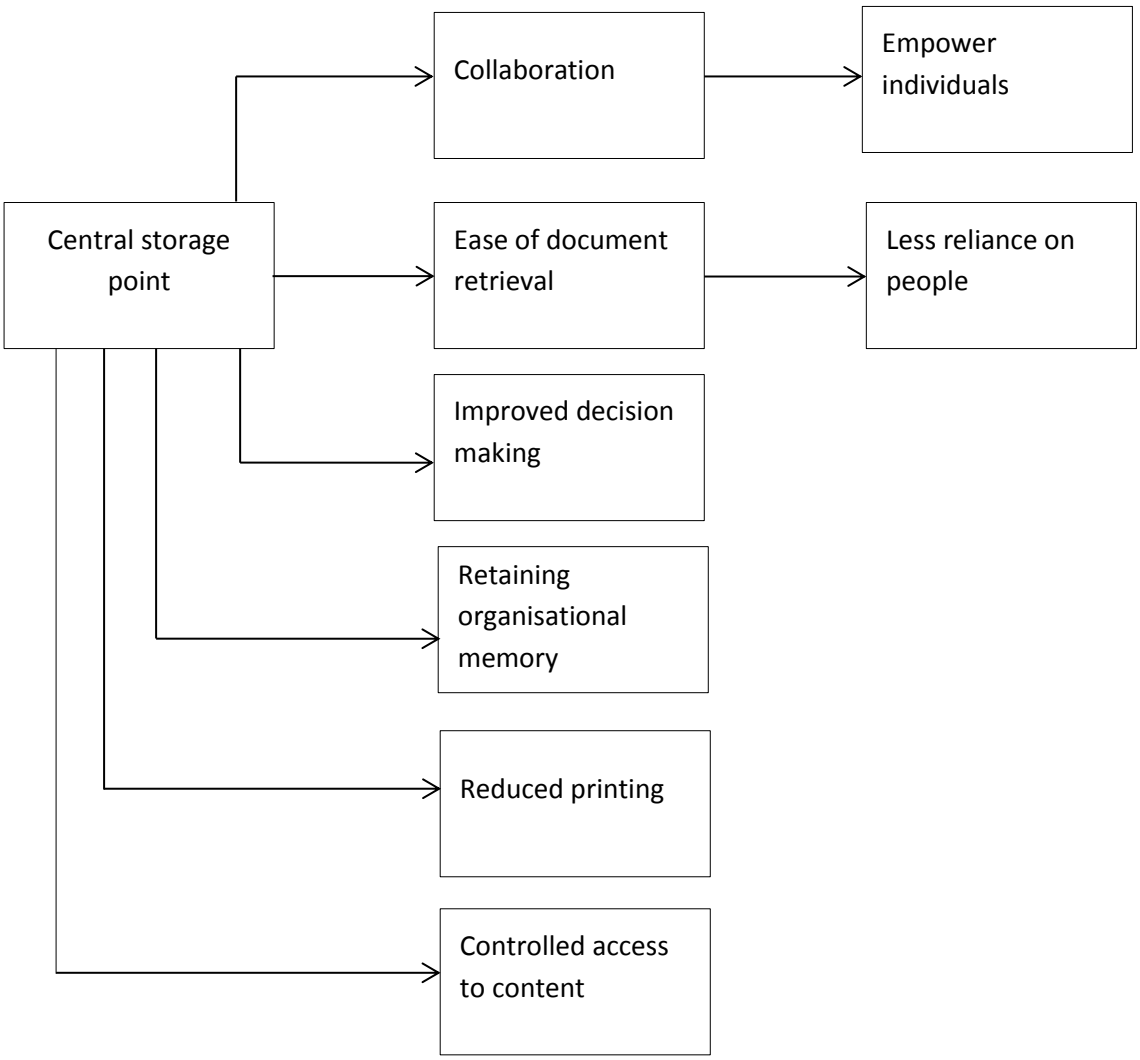

Figure 15: ECM benefits framework

Figure 15 shows that ECM benefits do not exist in isolation. This figure also shows the essential features of ECM benefits which are fundamental to the realisation of other benefits.

4.5 Essential feature

This involves instances where the second benefit is understood to be a consequence of the first benefit. As shown in Figure 15, there are benefits that point to other benefits, indicating that the first benefits are influencers of other benefits. Achieving the first benefit may cause a realisation of the secondary benefits.

Analysis of the final framework indicated that the central storage point has the highest number of dependences when compared to other benefits. There are eight secondary benefits which, directly or indirectly, depend on its realisation. These include retaining organisational memory, improved decision making, ease of document retrieval, less reliance on people, reduced printing, controlled access to content, collaboration and empowered individuals. This means that the failure to achieve a fully operational central storage point may inhibit full realisation of these other benefits which directly or indirectly are dependent on it.

There were no independent benefits which emerged from this study. The researcher also found that reduced printing is one of the major secondary benefits to be achieved following ECM system implementation.

4.6 Research findings: barriers

The aim of this section is to present the findings from an empirical study conducted in two separate public sector organisations in respect of barriers hindering the achievement of benefits from the use of ECM systems. In respect of barriers, five categories emerged – deployment problems, lack of staff buy-in, organisational challenges, negative user experiences and software challenges. There was no specific ECM barrier framework available in the literature; Table 8 was inductively derived from data collected and analysed.

Table 8 provides a summary of barriers evident in both cases, with the total number of text appearances found in the transcript as well as the total number of respondents mentioning the barriers. This table also shows the six barriers identified in the literature which are denoted in the literature barrier column. The literature barriers highlighted in bold show the barriers that the participants have experienced. Lack of top management support and inappropriate IT selection and configuration were the only two barriers found in literature. Four out of the six barriers did not emerge in the study; however, there were new barriers that emerged. The themes highlighted in red emerged from the study but had low responses and will not be discussed further.

Table 8: ECM barriers

Barriers preventing benefits from being achieved			Number of text excerpts		Number of respondents	
Main-theme	**Sub-theme**	**Literature Barrier**	**Count: Case 1**	**Count: Case 2**	**Count: Case 1**	**Count: Case 2**
Deployment problems	Insufficient training	Not found	1	2	1	2
	Lack of awareness	Not found	2	0	1	0
	Usage restricted to certain users	Not found	2	4	2	2
	Technical errors	Not found	1	12	1	3
Lack of staff buy-in	**Lack of top management support**	**Lack of top management support**	3	0	1	0
	Resistance to change	Not found	4	3	2	1
Organisational challenges	High pressured environment	Not found	2	0	1	0
Negative user experiences	Lack of system understanding	Not found	1	2	1	2
	Time consuming	Not found	10	13	4	5
Software challenges	Complex system	Not found	15	2	8	2
	Inappropriate IT selection and configuration	**Inappropriate IT selection and configuration**	6	0	2	0
		Lack of proper communication				
		Lack of resources				
		Organisational culture				
		Lack of establishment of metrics				

In this section, the main sub-themes will be presented in detail and will be supported by reference to the literature. The literature had limited identification of barriers that occurred from the use of an ECM system which might have hindered the achievement of benefits in public sector organisations. However, the ERP barriers were identified to derive at the ECM barriers.

4.6.1 Deployment problems

The implementation of an ECM system does not guarantee that the employees within the organisation will adopt the measures and habits that are required for a successful long-term realisation of ECM benefits. Deployment problems are one of the barriers which public sector organisations experienced and this section describes how the public sector organisations experienced the ECM implementation process. In this main theme, there are four sub-themes, namely insufficient training, lack of awareness, usage restricted to certain users and technical errors. As mentioned, two sub-themes, insufficient training and lack of awareness, will not be discussed in detail because there were few responses from the participants interviewed.

4.6.1.1 Usage restricted to certain users

Usage restricted to certain users was identified as a barrier preventing the achievement of ECM benefits. It is worth mentioning that controlling access is actually a system benefit and this might have been done intentionally. This sub-theme appeared six times and was mentioned by four participants from the eleven participants interviewed. For example, one participant said: "*There are changes that I cannot make for example if it's something that has to do with a degree" (P10, C2).* Due to restrictions with the system, specific persons can only make certain changes and this is because of how the system was set up.

The other participant also made a comment*: ". . . too many systems things that are out of our control . . ." (P7, C2).*

Discussion

In general, participants shared the view that the usage of the ECM system was restricted to certain users; perhaps this was the reason why the benefits associated with its use were not fully achieved. In C1, the ECM system was mentioned as being used mainly by the support staff rather than employees in management positions, as stated by P3: "*ECM system is really used by the support staff".* It was mentioned that the system has permission levels allowing only specified sub-groups of permission to users, therefore the system allows assigned users to a specific area (Kitta, Grego, Caplinger, and Russ, 2011).

4.6.1.2 Technical errors

This sub-theme described the inflexible nature of ECM configuration settings and is one of the sub-themes that emerged from the study. This sub-theme refers to the mismanagement of documents that are not retrievable when searched for in the system – this is due to the mismatch of operating systems. Four participants indicated that there were challenges in the software setup or configuration that prevented the system from achieving its benefits. The following quotes are revealing:

". . . and again the design of the system did not allow for sharing of information and it has got to do with the levels of access . . ." (P6, C1).

"We have to double check what the systems shows with files done manually to ensure that the system does not give errors" (P10, C2).

Discussion

In general, participants shared the view that one of the reasons the benefits were not achieved was due to technical errors and system configuration issues. Four out of eleven participants acknowledged this as a barrier that prevents the ECM benefits from being achieved and the biggest challenges occurred with C1. By technical errors, this study refers to the problems that occurred in the enrolment stages of the system, which were seen post-implementation. This could be as a result of not having the ECM application installed as a default in every employee's computers.

Other challenges faced were as a result of implementation difficulties and one participant had this to say: "*We experienced implementation challenges but rather I would say its full fruits were not fully realised due to implementation challenges" (P6, C1).* Implementation of systems, especially ERPs, normally requires an alignment of business processes as well as software configurations (Al-Mashari, 2002).

4.6.2 Lack of staff buy-in

Lack of staff buy-in is one of the barriers which public sector organisations experienced. In this main theme, there are two sub-themes that emerged, namely, lack of top management support and resistance to change.

4.6.2.1 Lack of top management support

In this study, lack of staff buy-in refers to management not using the implemented systems and this was a theme that emerged as a barrier from achieving the benefits of using an ECM system. This is supported by C2, where it is mentioned that buy-in from top management is a critical success factor (DC7 in Table 4). However, only one out of eleven participants interviewed mentioned it three times repeatedly as a barrier to achieving the benefits. This sub-theme will not be analysed or discussed any further due to its low level of response during the interview sessions. Top management support has been a challenge in ECM system implementation (Wiltzius et al., 2014); this has not only been a challenge with ECM implementation; ERP implementation also experiences a lack of staff buy-in (Somers and Nelson, 2000).

4.6.2.2 Resistance to change

Generally, people are not willing to change unless there is a good reason for that change and the benefits are clearly seen and understood and subsequently realised. In this context, resistance to change refers to the inability of employees to adapt to change that is forced on them in the form of a new system. The organisation represented by C2 has raised resistance to change as a project constraint and as a high level risk (DC7 in Table 4). In the course of the interviews, it became clear that not all the benefits of an ECM system were applicable to everyone. The sub-theme appeared seven times and was mentioned by three people. Some participants indicated how employees resisted the new system as follows:

"In the beginning it was a very difficult task to bring people on to the board" (P2, C1).

"No, people are resistant to change" (P6, C2).

"Certain people have had challenge to adapt in the system" (P11, C2).

Discussion

In general, participants shared the view that the benefits were not achieved due to resistance to change. It was found that employees did not want to use the new system as they were used to having hard-copy documents, as stated by one of the participants: "P*eople are used to have hard copies at the desk and to view and sign the documents and everything*" *(P2, C1).* People

are keen to use what they are used to rather than to use a new system they are not familiar with.

It was found that employees did not want to use the ECM system because it was different from what they had used previously. One person interviewed mentioned this: "*We thought that it would have worked better for us than it did last year because last year we did not do it on the system and we felt that it was easier last year than it is this year with the system" (P6, C2).*

The findings show that resistance to change was caused by the challenges of adapting to a new system. One participant commented that: ". . . *getting people to adapt to using a new tool . . . ." (P11, C2).*

It was also evident that people doubted the system and had no confidence in it: "*For me it's something that at this stage I cannot trust because all the time that we are given an opportunity to change whatever it comes back with more errors" (P9, C2).* If people were part of the implementation stage and properly educated in the need for the new system, then some of these problems could have been eliminated.

Literature also shows that the ECM system is not fully utilised, not because of technical complexities, but often because of soft factors such as resistance to change (vom Brocke, Sonnenberg, and Buddendick, 2014).

Figure 16 shows that technical errors can result in resistance to change. This was evident in the quote extracted from one interview: ". . . *people are resistant to change and of course the implementation challenges made it difficult as well"* (P6, C1).

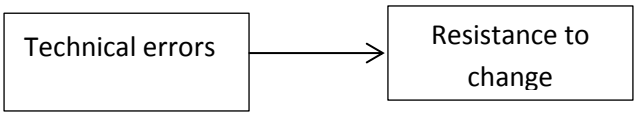

Figure 16: Technical errors can result in resistance to change

4.6.3 Organisational challenges

Organisational challenges are a main theme that emerged from the study. The sub-theme that emerged was a high-pressured environment, which means a high-paced work environment resulting from clients demanding deliverables in very short time periods. This sub-theme was

mentioned by one participant out of the eleven participants interviewed and therefore it will not be analysed or discussed any further.

4.6.4 Negative user experiences

In this context, the term 'negative user experience' refers to how the users of the ECM system have negatively experienced the use of the ECM interface. This section focuses on two sub-themes, namely, time consuming and lack of system understanding. Since the lack of system understanding appeared only three times, it will not be discussed any further.

4.6.4.1 Time consuming

The time-consuming sub-theme refers to the fact that an ECM system is not fully automated as there is a manual process of uploading documents which takes time. Out of eleven participants interviewed, nine have raised this theme as a barrier and it was mentioned 23 times during the interview sessions, making this the highest ranked barrier. Participants said the following:

"With the version we are utilising everything has to be done manually so people do not use the system because it is time consuming" (P5, C1).

"There are too many delays" (P7, C2).

"It takes some time for the system to load" (P3, C1).

Discussion

Participants have raised the issue that using an ECM system can be time consuming and this was the highest ranked sub-theme amongst the other barriers raised. To a greater or lesser extent, almost every participant had experienced this to have affected his or her own work experience. In contrast, previous studies have stated that the main benefit of ECM is to reduce the time spent in searching for content (Kemp, 2007). This also agrees with the previous findings which reported that ECM is believed to assist in reducing search times (Hullavarad, O'Hare, and Roy, 2015). However, both these findings were not supported in this particular research, as most participants felt that ECM was time consuming.

Figure 17 below illustrates that technical errors can be time consuming (delays)

Analysis suggests that technical errors can be time consuming (delays). As explained by P9, "*In terms of time it's costing us too much time because we have to double check what the system shows with files done manually to ensure that the system does not give errors*".

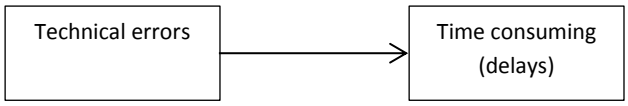

Figure 17: Technical errors can be time consuming (delays)

4.6.5 Software challenges

Hardware and software challenges refer to the challenges that the users face when using the ECM system. This section focuses on two sub-themes, namely, complex system and inappropriate IT infrastructure.

4.6.5.1 Complex system

In this study, a complex system refers to a system that is complicated and, as a result, the user struggles to navigate it. Despite ECM being a system that assists organisations to cope with the complexity of large volumes of data, during the interviews seven participants mentioned that ECM is a complex system. The following quotes report what was stated.

"Initially it was very difficult for the employees to use it" (P2, C1).

". . . fairly complicated system . . ." (P3, C1).

"It's one of those systems that if you don't use it regularly you kinda forget how to use it" (P4, C1).

"A*t the moment I am really finding it very challenging" (P8, C2).*

"If you are in training it seems there are so many things to remember" (P7, C2).

Discussion

The ECM system was meant to assist organisations to cope with the increasing complexity and volume of data and information (Alalwan et al., 2014). A previous study conducted on ERPs indicated that the interface of an ERP system is highly complex and is bound to have

irrelevant or unnecessary data displayed (Hong and Kim, 2002). From this, it can be seen that ERPs should be expected to be complex systems, as are ECM systems.

Figure 18 below shows that technical errors in the system can actually cause a system to be complex. This was evident in the quote extracted from one interview: "*At the moment it has errors that are coming back and the fact that we cannot do the formatting ourselves*" *(P2, C2).*

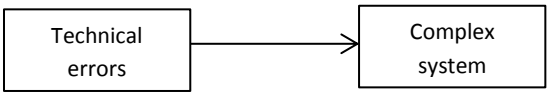

Figure 18: Technical errors can cause a system to be perceived as complex

4.6.5.2 Inappropriate IT selection and configuration

Inappropriate IT selection and configuration was identified as a barrier. The sub-theme appeared eight times and was mentioned by two participants. Some participants indicated how employees resisted the new system by making the following statements:

"The current version that C1 is using is not user friendly because it clashes with the Windows software that we have" (P5, C1).

"And again the design of the system did not allow for sharing of information and it has got to do with the levels of access due to how the system was designed" (P6, C1).

Discussion

In previous studies, inappropriate IT selection and configuration was also identified as a barrier to achieving the expected benefits (Ebrahim and Shawi, 2004). In the study pertaining to e-governance in South Africa, one of the findings was the fact that South Africa does not have a strong IT infrastructure, hence there tend to be failures in IT projects (Mutula and Mostert, 2010). It was reported that adequate IT infrastructure was an important factor for a successful ERP implementation and that the ERP software vendor certifies which hardware must to be used to run the ERP system (Mohmed and Al-Sabaawi, 2015).

Figure 19 shows that an inappropriate IT selection and configuration can result in technical errors. This was evident in the quote from one interview: *"The current version that C1 is*

using clashes with the Windows software that we have, it is mismanaged so documentation disappears in cyber space" (P5, C1).

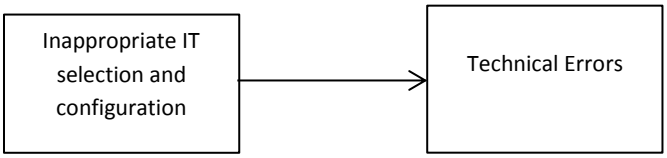

Figure 19: Inappropriate IT selection and configuration can result in technical errors

Figure 20 below also shows that an inappropriate IT selection and configuration can result in a system being perceived as being complex. This was evident in the quote from one interview *"Configuration is not friendly with respect to access it from anywhere . . . it's an online system it's supposed to be flexible and allow access at anywhere" (P6, C1).*

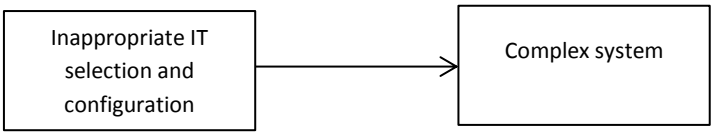

Figure 20: Inappropriate IT selection and configuration can result in a complex system

Figure 21 below shows that an inappropriate IT selection and configuration can result in usage being restricted to certain users. This was evident in the quote from one interview: *"There are too many systems things that are out of our control" (P7, C2)*. The theme of 'usage restricted to certain users' was not found in the literature but only emerged in the study.

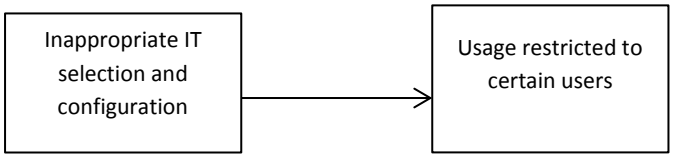

Figure 21: Inappropriate IT selection and configuration result to usage being restricted to certain users

4.7 Discussion: Emerged barriers framework

The diagrams which emerged as barriers to successful ECM implementation were all integrated into a final framework referred to in this study as the Barriers Framework and is shown in Figure 22.

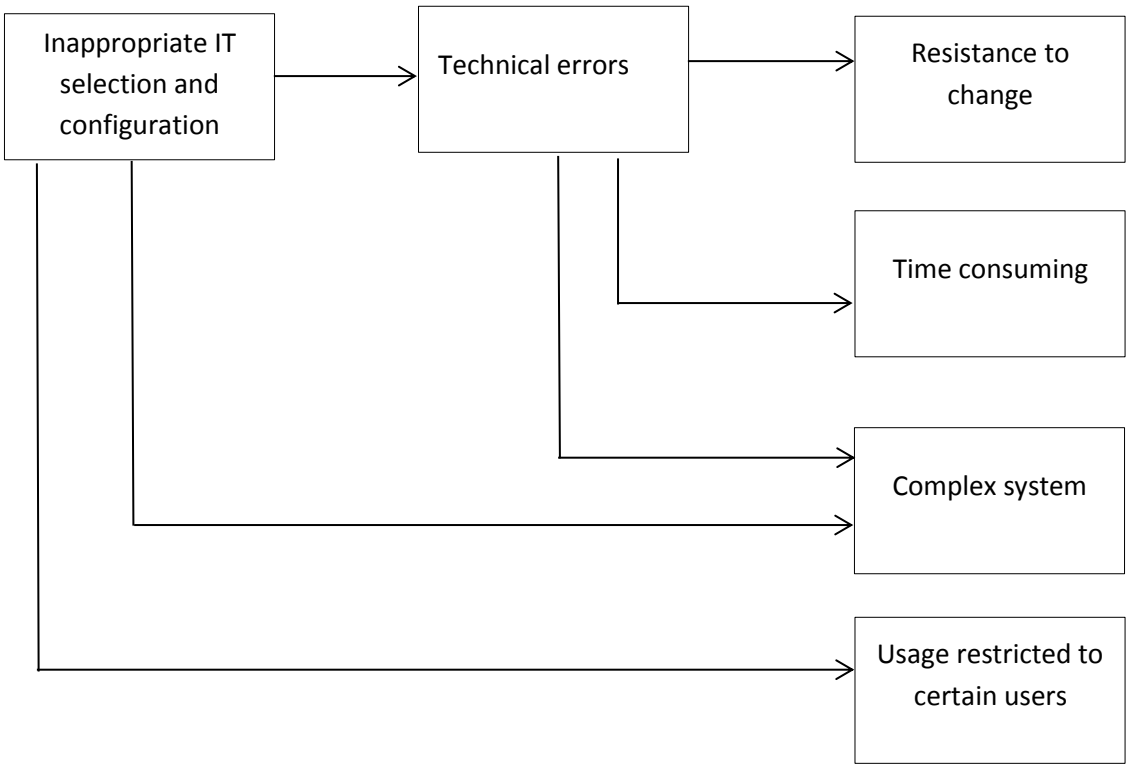

Figure 22. The independency of ECM barriers

Figure 22 shows barriers that are linked to one another. It is important to note that the researcher did not take into consideration the sub-themes with few responses such as lack of system understanding and lack of awareness. Likewise, as with the benefits earlier, the barriers also point to other barriers. Analysis of the final barrier framework indicated that 'time consuming' has the highest number of occurrences when compared to other barriers, however, with no dependencies. The 'technical errors' theme resulted in resistance to change and to a complex system. Technical errors can be time consuming. According to this study, 'inappropriate IT selection and configuration' can result in a complex system and usage being restricted to certain users. The most barriers mentioned which hindered the achievement of ECM benefits was 'time consuming (delays)' and 'complex system', with 9 and 10 occurrences respectively.

4.8 Summary of Chapter 4

The purpose of this study was to explore ECM benefits and also the barriers that prevent the expected benefits from being achieved. In this chapter, the emerging benefits were identified, presented, interpreted and discussed. Table 6 shows a summary of all the themes and sub-themes that emerged from the study. The essential feature was discussed and ECM benefits framework shown in Figure 15.

This study also identified and explored the barriers preventing the ECM benefits from being fully achieved. The barriers were all interpreted and presented in Table 8. As far as the barriers were concerned, there were some that were not discussed due to the low response rate. However, the most dominant barrier that this study found was that the ECM system can be time consuming and that ECM is a complex system.

Chapter 5: Conclusions

The aim of the study was to understand the achievement of benefits through the use of ECM systems in public sector organisations. Through the multiple case study approach, the understanding of benefits of using ECM was achieved. This research had three subsidiary objectives. The first was to understand what benefits are actually achieved through the use of an ECM system. The second was to understand how the benefits are achieved through the use of an ECM system. The third was to find out why the advertised benefits of using an ECM system are not fully achieved in public sector organisations. This study achieved the above mentioned objectives, using deductive and inductive research approaches. The resultant ECM benefits framework was derived from the ERP benefits literature framework initially used, while barriers were not.

5.1 Research outcome

This chapter also outlines the research questions investigated, as shown below:

- What are the benefits of using ECM in public sector organisations?
- How are the benefits achieved?
- What are the barriers from achieving the ECM benefits?

5.1.1 Research problem

In this study, the research problem is that benefits of ECM systems are not clearly understood and are not always achieved in public sector organisations.

5.1.2 Solutions

The secondary research questions were answered through presenting a benefits framework which was adapted from an ERP system. This framework identified and categorised the benefits associated with the use of an ERP system. The same framework was used to identify the ECM benefits since there was no ECM benefits framework from the previous studies investigated. Therefore, the ERP benefits framework was used to gather data from the participants in both organisations, each participant identifying what benefits they had achieved through the use of an ECM system.

Lastly, there were challenges that were faced by the participants in achieving the benefits and these were identified as barriers preventing the full achievement of benefits by these two organisations.

5.1.3 Key findings

The findings show that even though the public sector organisations implemented ECM systems, not all the benefits identified in the literature were achieved. New benefits were also identified that had not been mentioned in the previous studies. From the sample cases, one case (C2) documented the benefits upfront but the other case (C1) did not do this, making it difficult for the benefits to be evaluated and to determine whether the system had been implemented successfully.

The three expected benefits were achieved by C2, namely: reduction in the amount of duplication of the handbook content, consistency of content and time saving (because documents are retrieved faster). However, the five most significant ECM benefits identified by the two cases were the following:

- There is a central storage point.
- It reduces printing of documents.
- There is controlled access to content.
- There is ease of document retrieval.
- There is faster retrieval of documents.

The five benefits mentioned above have been given in rank order when compared to other identified benefits of using an ECM system. The definition of ECM being an integrated technology was adhered to, as the participants in both cases mentioned it to be an integrated system which assisted with structuring the content, keeping it in a centralised storage point and eliminating working in silos.

From the literature, even though there was no ECM benefits framework, there were ECM benefits identified such as cost and efficiency, compliance and security, continuity, consolidation and integration, collaboration and customer service. In contrast, this study did not identify customer service as a benefit. Further, continuity was treated the same as retaining organisational memory. Also, consolidation and integration were treated the same as a central storage point.

Looking at the conceptual framework proposed by the researcher, it was validated and it was found that very few of the expected benefits were achieved. Instead, more new benefits were identified. From all the benefits identified in the conceptual model, the five achieved and confirmed were: cost reduction, time reduction, improved decision making and planning, empowerment and user friendliness.

There were new ECM benefits and barriers that emerged from the study, hence Table 6 and Table 8 could be used as potential frameworks for ECM benefits and barriers identification.

The most highly ranked (top three) barriers preventing ECM benefits from being fully achieved in public sector organisations were identified as: the system is time consuming, it has technical errors and it is a complex system to use. The time-consuming barrier was cited as the most dominant barrier. It was also evident that the system was not properly explained to employees prior to implementation, hence there was resistance to change.

5.2 Theoretical contribution

The structural nature of theory in Information Systems (IS) is examined using five types of theories (Gregor, 2006). The five theories are: (i) theory for analysing and describing, (ii) theory for understanding, (iii) theory for predicting, (iv) theory for explaining and predicting and (v) theory for design and action (Gregor, 2006). It was thus important for this study to adopt a particular theory suitable for this study, thus allowing for some theoretical contributions. Therefore, the theoretical contribution of this research is discussed in light of Gregor's (2006) second type of theory named the theory for understanding. However, this study is not devoted to explain all the five types of theories but only to motivate for the chosen one.

According to Gregor (2006) the theory for understanding is drawn from a study of how and why things happened in some particular real world situation. Given the fact that this was a case study, it was ideal to use the theory of understanding as a theoretical lens as the study explored the benefits of using an ECM system and identification of barriers preventing such benefits from being achieved. For this type of theory to be developed, the research approach can include case studies (Yin, 1994).

The analysis of this study resulted in the formation of benefits and barriers frameworks as shown in Table 5 and Table 6. These frameworks contribute to understanding what benefits are actually achieved, how the benefits are achieved through the use of an ECM system in public sector organisations and what the barriers are to achieving the ECM benefits.

This study contributes to the understanding of ECM benefits and barriers in public sector organisations. Also, from the analysis there were new benefits and barriers identified which were not in the previous ECM literature.

5.3 Practical contribution

The practical contribution of this study is that public sector organisations can use the framework developed for identification of ECM benefits, particularly in public sector organisations. It is certain that this study will provide researchers and practitioners alike with some perspective with regard to the benefits of ECM systems as well as the barriers preventing such benefits from being achieved.

Below are some of the practical implications of the study:

- For public sector organisations to achieve the ECM benefits, users need to be engaged prior to the implementation system.
- The inappropriate IT infrastructure barrier on ECM should not be overlooked in organisations.

In addition, the findings of this study will provide the necessary information to assist the project managers involved in the implementation stage to: a) ensure that the ECM benefits are identified prior to system implementation b) ensure that the ECM benefits are ultimately evaluated post-implementation.

5.4 Research limitations

The first limitation of this study would be that, although it has focused on public sector organisations, future research should look at private sector organisations. However, the main limitation of the study was the fact that it was difficult to find relevant information in the

literature, as there had been few studies performed in public sector organisations pertaining to the achievement of benefits through the use of an ECM system.

Secondly, the researcher had to plead to be allowed to participate in both cases and none of the top management employees participated in the study. This limited the research findings, as some of the research questions were not answered. However, secondary data was used to develop the understanding of the context for implementation of the ECM systems. However, there were gaps in the secondary data because of limited implementation documentation.

5.5 Implication for further research

Future research could focus primarily on further validating the benefits and barriers frameworks discovered in this study. These frameworks could also be used to identify further ECM benefits and barriers for ensuring that, in the future, the implementation of ECM systems is successful with benefits achieved in the public sector organisations.

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Appendix A: Individual Participation Consent Form

One of the requirements in the Master's Degree in Information Systems at the University of Cape Town is the completion of a research project. I am a student currently working on a research topic titled: *Understanding the achievements of benefits through use of Enterprise Content Management (ECM) System in Public Sector Organisations.*

I would therefore appreciate if you could allow me to interview you and this will take approximately 30 - 45 minutes of your time. The main objective of the interview is to find out:

"What are the benefits achieved through the use of ECM in public sector organisation as well as to understand why the benefits of using ECM are not achieved".

The research objectives of the study are to:

- To enhance the understanding of achievements of benefits through ECM use in public sector organisations;
- To understand how the benefits are achieved;
- To understand what prevents the benefits from being achieved; and

Research ethics is of importance therefore this study has been approved by the Faculty of Commerce Ethics in Research Committee at the University of Cape Town. Anonymity of all the information provided is guaranteed. Upon request the results will be made available to you.

Your participation in this study is entirely voluntary and you will not be required to supply any identifiable information and you may choose to withdraw at any point in the interview. However, if you would like to participant in this study please assist us by filling in the consent form below.

Once again the researcher guarantees the anonymity of the information provided in the study.

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Signature_____

Lumka Thami Salamntu (Researcher)

Lsalamntu@gmail.co.za

072 4994 697

Signature_____

Prof Lisa Seymour (Supervisor)

lisa.seymour@myuct.ac.za

021 650 4259

Appendix B: Commerce Faulty Ethics Approval

I certify that I have read the the Commerce Faculty Ethics in Research policy ☒ (http://www.commerce.uct.ac.za/Pages/ComFac-Downloads)

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism

Signed by:

	Full name and signature	Date
Principal Researcher/Student:		2 December 2015

This application is approved by:

Supervisor Lisa Seymour		2 December 2015
HOD (or delegated nominee – for all Honours Projects):		
Chair: Faculty EIR Committee (only for postgraduate research at Master and PhD level)		3.12.2015

Appendix C: Organisation permission to perform a case study

Good day sir/madam

My name is Lumka Salamntu, a student at the University of Cape Town in the department of Information Systems. I am currently conducting a research study on understanding the benefits of using Enterprise Content management (ECM) in public sector organisations.

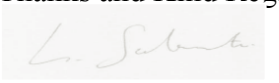
The objectives of the research are to:

- Understand what benefits are achieved through the use of ECM in public sector organisations
- Understand why the benefits of using ECM are not achieved in public sector organisations

Subsequently, the research question has been formulated as "What are the benefits of using ECM in public sector organisations". This research seeks to understand the achievements of benefits through the use of ECM in public sector organisations as well as the reasons and perceptions explaining why the benefits of using ECM are not achieved.

As the means to answer the research questions, we would like to request permission to perform a case study at your company. For the case study we would like to interview some of your employees and a viewing of supporting ECM documentations will also be appreciated. It should be indicated to you that, the participants as well as the organisation's name will be kept anonymous and all the information gathered will be treated as confidential. In addition participation to the study will be voluntary and one can opt to withdraw from the research at any point in time. The interview will be planned to take approximately 30 to 45 minutes per each participant and each participant will not be requested to supply any identifiable information thus ensuring their anonymity. As far as ethics is concerned, this study has been approved by the Commerce Faculty Research Committee and what is required is your company's interest to participate in the research. The approved ethics letter will be forwarded to you on request.

Thanks and Kind Regards



Miss Lumka Salamntu (Researcher)

Prof. Lisa Seymour (Supervisor)

Appendix D: Interview questions

The following is an outline of the interview questions which are intended to be open-ended. Therefore these will not necessarily be adhered to, as new questions can arise based on the flow of the interview, since this is semi-structured. The interview questions will take approximately 30 - 45 minutes to be completed.

1. Opening Questions

1.1	What is your academic discipline(s)?
1.2	Can you explain in your own words what you understand to be an ECM system?
1.3	Can you describe the benefits that are associated with the use of an ECM system?
1.4	How often do you use the ECM system, and please describe your own experience with the system?

Content Questions

2. Operational

2.1	Can you explain how the implementation of the ECM system assisted in increasing the level of productivity in the organisation and if it didn't please explain why not?
2.2	Can you explain how ECM has increased efficiency compared to when the organisation was not using the ECM system and if it didn't please explain why not?
2.3	Can you explain the operational benefits associated with the use of the ECM system?
2.4	Can you explain how the implementation of the ECM system increased collaboration between the various departments with the organisation and if it didn't please explain why not?

3. Managerial

3.1	Can you describe the managerial benefits associated with the use of the ECM system?
3.2	Can you describe any improvements made by the use of ECM system in the organisation and if there have not been any improvements why not?

4. Strategic

4.1	Can you explain the strategic benefits associated with the use of the ECM system?

5. IT Infrastructure

5.1	Describe any IT Infrastructure benefits associated with the use of the ECM system and if there has not been any please explain why?
5.2	Can you explain any IT cost reductions as a result of using the ECM system and if there has not been, why not? If there have been cost reductions, what would you estimate these to be?

6. Organisational

6.1	Can you explain how the implementation of an ECM system in this public sector organisation created an organisational culture and if it hasn't why not?
6.2	How has the ECM system positively affected the organisation's content management for example in terms of reducing the content duplication and if not why not?
6.3	Can you explain the changes made by the implementation of the ECM system in the organisation?

7. Employees

7.1	Can you explain the benefits for employees from the use of the ECM system?
7.2	How can you explain the overall impacts of the ECM system on employees?

8. Environment

8.1	Can you explain the environmental benefits associated with the use of the ECM system?

9. Concluding Questions

9.1	Describe in detail other benefits of using the ECM system?
9.2	Do you have any questions for me?

Appendix E: Sample Interview transcript

(…) [Some text removed for some confidentiality purposes]

Interviewer: Can you describe the benefits that are associated with the use of an ECM system?

Interviewee: Primarily access of information from one point and preservation of an organisation's information as opposed to information being kept in personal computers.

Interviewer: Can you describe your own experience with the system?

Interviewee: I was a champion of the system and I used to promote it, but last year I struggled to log in to the system, so after several times of struggling to log in I just threw the system away

Interviewer: Did you follow up with IT to try and sort out your problem?

Interviewee; Yes, every time I struggled to log in I had to log a call with IT , but you know, there is limits to what humans can do after sometime one just becomes frustrated and maybe think there is something wrong with the system.

Interviewer: At the time you were using the system right?

Interviewee: Yes, at that time I was a regular user of the system

Interviewer: Can you explain how the implementation of the ECM system assisted in increasing the level of productivity in the organisation and if it didn't please explain why?

Interviewee: I wouldn't really say because the system we have is actually a very complex system and I would not say it increased productivity because we experienced implementation challenges but rather I would say its full fruits were not fully realised due to implementation challenges.

Interviewer: So you say it had challenges in the implementation stage?

Interviewee: Yes I would say so, and also as I said even as the champion of the system I decided to not use the system because it had implementation challenges.

Appendix F: Sample of coded themes

Participant	Case	Main theme	New Theme	Original Theme	Category	Text
P1	C1	Independent central repository	Improved content management	Quality Improvement	Operational	I think the benefits is not having to remember where I've saved my document
P3	C1	Cost cutting	Saving paper	Cost reduction	Operational	If the various parties know where to find the document then they would not go and print the document over and over again to view the document
P5	C1	Facilitate organisational learning	Empowers individual	Empowerment	Organisational	Based on when I started there has been improvement, purely because we have reinforced the usage of ECM and continuous one on one training intervention.
P1	C1	Facilitate organisational learning	Empowers individual	Empowerment	Organisational	Some of the staff actually through the use of ECM they have actually become more proficient in the IT skills seeing that they need to deal with the system on a daily basis.